The Journal of Occupational Diseases and Traumatic Surgery

Industrial Medicine

for

Physicians and Surgeons in Industry

Volume 9A DECEMBER, 1940 Number 12

THIS ISSUE

Mental Hygiene and Industry

—in an Ailing World—

Industrial Health

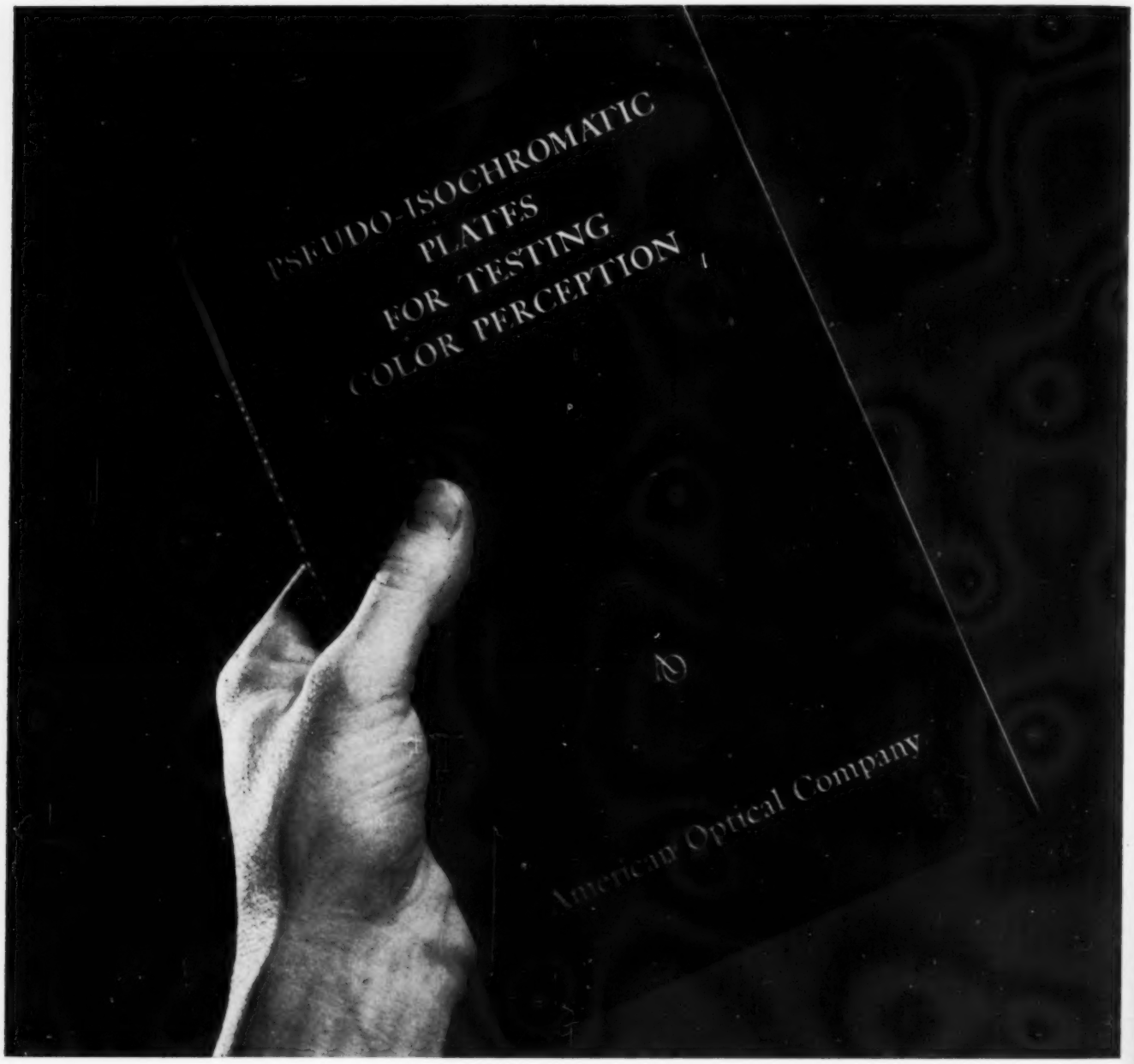
—From the Viewpoints of:

Employer	—	Employee
Physician	—	Hygienist
Law	—	Insurance
Labor	—	Finance
Safety	—	Public Relations
Nursing	—	Research
Selection	—	Psychiatry

The National Defense

The General Practitioner

The Humanitarian Appeal



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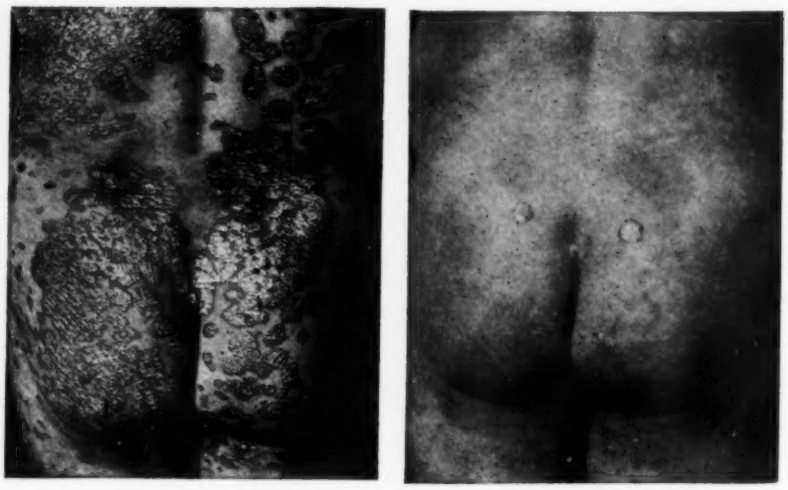

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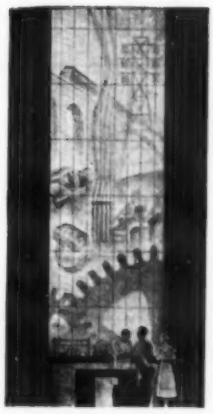

OCCUPATIONAL DISEASES
TRAUMATIC, INDUSTRIAL

INDUSTRIAL MEDICINE
& RAILROAD SURGERY

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THIS MONTH

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INDUSTRIAL HEALTH and DISEASE:

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—as a Specialty

FOLLOWING DR. NASATIR'S able and interesting discussion of "Mental Hygiene and Industry in an Ailing World" (page 583), this issue steps off into "Industrial Health," and adds some more to the so many things said about it. As the editorial remarks (page 638), "For many years industrial health has been one of the most 'talked about' subjects in the whole field of industrial endeavor." During the last several years, and especially during the year just closing, the term has been on thousands of tongues, in hundreds of articles, and on dozens of programs. But we doubt if more than a handful of the many who have been talking about it have had other than a vague and indefinite idea of what it really means. We believe it will take the reading of this issue — the proceedings of the first annual Conference on Industrial Health given here, from end to end — to enable anyone to put the substance of reality behind whatever definition of "Industrial Health" may suit him best. For it took the whole of the proceedings to do justice to the size, and scope, and far-reaching significance of all the many things involved in it. It took 18 discussions to run the gamut of the elements of cooperation and coordination which must work together to produce the maximum result.

And what a gamut! Employer; employee; physician; hygienist; insurance; law; labor; personnel; selection; finance and accounting; safety; public rela-

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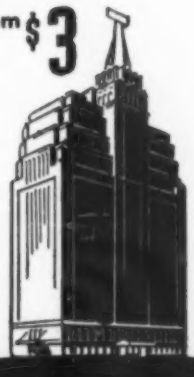

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—*Continued from page 3.*

tions; nursing; research; psychiatry — an harmony of notes sounded each by an expert, and each in the key of its own characteristics, yet all blending into a presentation which, heard, will be remembered, and read, cannot be forgotten.

In other words, here *is* "Industrial Health!" Here, in the pages of this issue, exist the definition, the description, the texture, the meaning, the substance, the theme and all the nuances of this very vital element of our economic status, to be read, and studied, and understood — and put to continued, and inevitably also, to profitable, use.

With which panegyric, we commend it to every reader. . . .

If any reader, however, should remark the emphasis in one place upon the economic values of industrial health as against the stress in another upon the humanitarian significances, may we suggest that the two are not opposite here, but only apposite. Nor need they be opposed in any intrinsic connotations. They are *both* involved, and both necessary. We suspect, human nature being what it is, that what starts out as one often becomes, or at least is often called, the other. . . .

It ought to be noted that DR. KIRBY's "Physical Examinations for Efficiency" (page 635), which follows the closing paper of the Conference on Industrial Health, is not one of the Conference papers. It expresses what might be thought an extreme view — the view, perhaps, which might have been a bit more prevalent years ago than it is now. But DR. KIRBY tempers the sternness of his rejection of "the substandard applicant" in such comments as this: "There are many places for such a person by which he might render splendid service for years."

The Council on Industrial Health of the A.M.A. announces its third annual Congress of Industrial Health in Chicago, next month (page 637). It's a three-day meeting this time.

The annual meeting of Air Hygiene Foundation held last month in Pittsburgh was reported for INDUSTRIAL MEDICINE by DR. J. R. GARNER, of Atlanta, Georgia. DR. GARNER's report will be a feature of the January issue. That issue will also carry the first of the Industrial Hygiene Sections for 1941.

Meanwhile, for all it can mean in these weary times of war, the "Compliments of the Season!"

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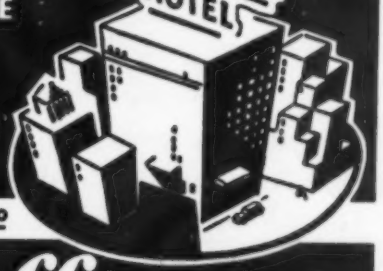

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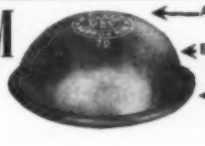

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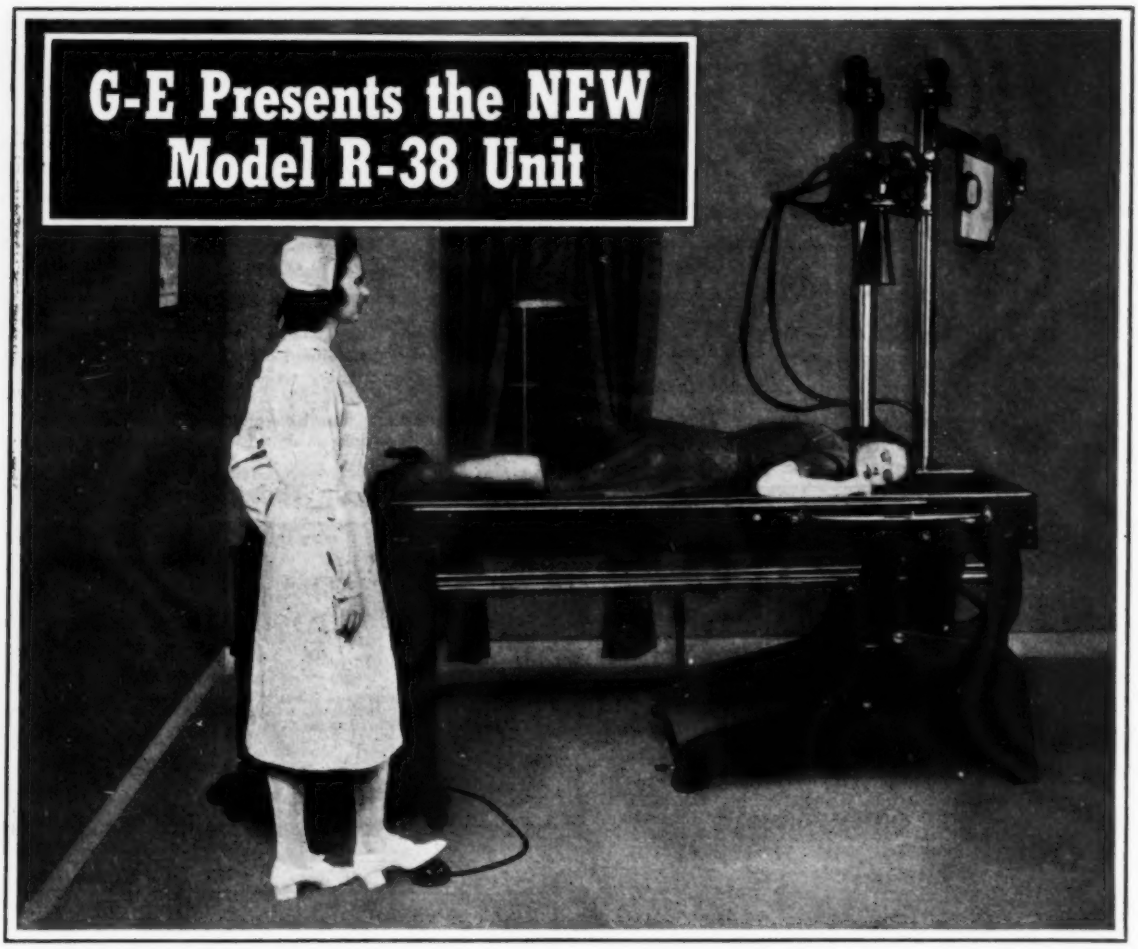

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The Journal of Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 9 DECEMBER, 1940 Number 12

Mental Hygiene and Industry

—*In an Ailing World*—

A. V. NASATIR, M.D., C.P.H.,
Director, Division of Industrial Hygiene,
Los Angeles City Health Department,
Los Angeles, California

MODERN industrial hygiene, of which mental hygiene is a part, started with those first laws passed in England directed at correcting the insanitary conditions of the workers' environment, arising out of the industrial revolution.[1] In this country, activities in industrial hygiene started with the first world war. Prior to this time the country was too busy growing, to be concerned with the workers' health. The advancing frontiers were still in motion. The movement of expansion which had occurred earlier in Europe was still in momentum in the United States up to the world war. Industry was still growing and the labor market was still unexhausted. It was easier to find new workers than to maintain old ones. The worker himself was a potential industrialist, and if working conditions were unsatisfactory there were new fields to explore either as an employee or employer.

Moreover, according to Dr. Alice Hamilton, as late as 1909, even doctors showed "the optimistic attitude of the employing class: They believed that American workers were so much better paid than Europeans, better fed and better housed, American mines and factories were so far superior to all others, that the dangers menacing the foreign worker were negligible here."[2] Several factors began to operate about this time to initiate interest in industrial hygiene. The first of these was the matter of industrial accidents. The advances in technology were causing increased numbers of occupational injuries. Few employers were disposed or could afford to pay wages to injured employees. Under the common law, a number of factors made it difficult for the injured worker to receive compensation for such injury, even when he instituted a civil suit, which was his only recourse. The unfairness of this resulted in a successful movement for passage of compensation laws which made it necessary in self-protection for employers to carry compensation insurance.[3] The insurance companies, on the other hand, were soon paying so many compensation awards, that they, in turn, in self-protection, had to persuade the insured companies to install safe equipment and accident preventing measures. In this way did the reduction of industrial accidents begin.

Another factor influential in giving birth to industrial hygiene was that during the world war, a series of poisonings in the munitions and war industries aroused the interest of a number of physicians in industrial poisons. Their investigations developed information regarding many occupational diseases formerly unsuspected, and an interest in methods of control. But not the least important item was that evidence was beginning to accumulate that a large labor turnover was much more extravagant and wasteful as a means of dealing with industrial accidents and diseases than was the installation of protective measures and health programs.

THE replacement of a worker, out of work because of occupational disease or accidental injury, costs the employer from $150.00 to $400.00, not including the compensation and other costs.[4] There results an inevitable disturbance in the rate and amount of production. Because of that the government is today taking steps to see that at least workers in defense industries will work under health supervision, realizing that it is cheaper to keep a skilled worker in good health than to train a new man to replace him.

Presented at the Fourth Annual Mental Hygiene Lecture Series, Jewish Committee for Personal Service.

It must, therefore, be apparent by inference that what affects the workers' health affects efficiency of production. Industrial hygienists have realized this.

Reviewing the various phases through which the industrial hygiene program has developed, the first was the interest in prevention of accidents. Closely related and following this was the attention devoted to occupational disease prevention. Though there has been a steady decline in the incidence of accidents in the past 20 years, there are still 16,000 to 18,000 accidental deaths and 1,500,000 lost time injuries yearly.[5]

The United States Department of Labor has conservatively estimated that the direct and indirect costs of these accidents is $5,000,000,000.00 a year. Other statistics, from the United States Public Health Service, show that loss of time from industrial accidents and occupational disease is only about one-fifteenth of the time lost by workers from non-occupational injuries and illness. Furthermore, 60% of the diseases causing the lost time were those non-industrial ailments associated with adulthood and middle age. This startling information indicates the necessity for increased public health efforts toward conserving the health of the adult population in general and the working population in particular.[5]

It is apparent that health will depend not only on the proper working environment, but also on the conditions which the worker meets outside of his place of employment. Not only this, but because the working population is an important component of the general population, a comprehensive health program for the worker is one means of extending public health benefits to the rest of the adult population.

As has been pointed out, mental hygiene is an integral part of industrial health, which is part of general public health. It may be expected, though, in a sphere of activity such as industry, which only very recently has developed an interest in conservation of physical health, that mental hygiene has not yet been accorded the attention it deserves. Yet there is no reason to believe that the problems of mental health in industry are any less than those of the general population, of which it is a part. It is not even definite that there are any specific or distinctive mental conditions which arise out of occupation or industry. As a layman, in the sense that I am not a psychiatrist, I have not been able to discover that the types of mental and nervous disturbances occurring in workers or the underlying factors which cause them are any different from those occurring in any other sector of the population. In fact, it is my impression that such cases that do occur arise out of conditions mostly external to the working environment.

To go a little further, then, I very timidly suggest that perhaps a real mental hygiene program for industry should start in the home at the time the worker is an infant. But perhaps I am a little ahead of myself. Let us see if the condition warrants our attention.

ACCORDING to Harold Dorn,[6] of the U. S. Public Health Service, 47%, or nearly half, of all the hospital beds in this country are occupied by mental disease patients, at an annual cost of $150,000,000.00. The number of hospitalized mental cases increased 40% in the 10 years between 1926 and 1936. This authority estimates that of the 2,145,000 children born in 1936, 110,000 to 120,000 will probably be committed to institutions for mental diseases. This does not include the large number of emotionally unstable and unbalanced persons who should be included in a comprehensive mental hygiene program. Does this mean that mental disease is on the increase? Yes and no. One must take into consideration that advances in medicine and public health plus certain social factors have produced a shift in the age distribution of the population. More people now are able to survive to the ages of maturity in which certain degenerative diseases like hardening of the arteries, rheumatism, cancer, etc., are likely to develop. The same holds true for mental disease. If considered with regard to the gross incidence of mental cases, one may say that mental disease is on the increase. If one considers the number of cases in proportion to the population and age groups, the answer is probably, No! It is important also to remember the element of better diagnosis and the effects of popular education. To quote Dorn, "the concept of mental ill health, with increased knowledge of the functioning of the human body, has gradually expanded until today it includes many conditions formerly considered normal. Fundamentally, even though there is a definite physical basis for many mental disorders, mental disease is a cultural concept and varies from one group to another. In some situations the mentally deranged have become soothsayers, medicine men, prophets or group leaders; in other situations the same persons would be incarcerated."

You have heard the cost of hospitalized cases. What about the cases not hospitalized and working in industry? Among the best records available are those from Great Britain, where the postal system constitutes a fair cross section of one group of industrial workers. Sir Henry Bashford, Chief Medical Officer, reports[7] that among the chief causes of absence, nervous disorders of a psychoneurotic type constituted 7.5% for males and 13% for females. The army in the last war rejected 70,000 men in the first draft because of mental and nervous conditions, or at a rate of 24 per 1,000. Of these, 31% were mentally defective and 17% were neurotics.

Dr. Parney, Chief of the Canadian Department of Pensions and National Health, Division of Industrial Hygiene, supervises 35,000 government employees. Eighty-three hundred, or 24% of these, were ill more than three days during the year 1937-38. Less than 5%, or 360, were responsible for nearly half the time lost by the entire group. They were diagnosed psychoneurotics, and aside from accidents were the second most important cause of lost time.[8]

AS A practitioner in the field of public health, all my concepts of health promotion begin with prevention. Any definition I might give to mental hygiene would be a little overbalanced on the side of prevention. Dr. Allen Freeman, Professor in the Johns Hopkins School of Public Health, claims that confusion surrounds the term.[9] "When we speak of mental hygiene," he says, "we may be considering either the need for improvement in the diagnosis and treatment of frank cases of mental disease, or an argument for broad sociological and economical changes which will reduce the pressure of anxiety or worry of the individual, and thus enable persons to maintain health who under existing circumstances break down." I leave this with you for the time being. Perhaps there are some mental diseases that are susceptible of curative treatment. I concede that any rounded program in health conservation must provide active therapy and curative treatment for obvious cases. But that, to my mind, is locking the barn after the horse is stolen. On one point I know you'll agree, and that is the best prevention is to eliminate the cause. And that's where you have me, and probably a good many psychiatrists too. While there may be certain clear cut types of mental disorders which are easily classified, there are certain types which are less easily defined.

Little as is known about frank psychoses, less is known about the causes of these borderline cases, which may be called mental disturbances only by courtesy.

For convenience I shall use a breakdown of cases applicable to industry and utilized by Dr. Lydia Giberson,[10] of the Metropolitan Life Insurance Company. She divides the cases into four basic types:

1. Organic conditions, including disturbances caused by tumors, epilepsy, syphilis, industrial poisons, etc.
2. Cases of frank psychoses or mental disease, such as manic depressive or schizophrenic psychoses;
3. The group known as psychoneuroses; and
4. Cases of maladjustment.

For the purpose of this discussion, it is clear that damage can occur in cases of the first two categories sufficient to produce an individual, social or economic liability. It need not be pointed out that the incidence of cases in the first category will be reduced in direct ratio to the effectiveness of efforts of preventive medicine and public health to control the specific conditions such as syphilis, industrial poisons, etc., which can cause them. I don't know yet how one can prevent brain tumors, so early diagnosis and treatment offers the best prognosis for this type of case.

It is in the second and third categories that mental hygiene must encounter difficulties, for here the causative factors are not so clearly outlined, and the borderline between a psychoneurosis and a psychosis may be like the equator of the earth. It's supposed to be there, but you need imagination to see it.

All the authorities agree on the importance of treating these cases. I have already mentioned that such individuals become a liability to themselves, because if they have a job they can't keep it. If they have none, they can't get one. They're a liability to their family and friends who must suffer financially and often emotionally, and in frank cases of psychosis the community eventually pays. It is essential, therefore, that such cases of mental breakdown be discovered and diagnosed in time to give them treatment and provide a chance for recovery and rehabilitation. If not, it is not unusual for such a worker to harm himself, his co-workers and the machinery before he is finally removed. It isn't necessary to point out the interferences with production and the disturbances in efficiency and well being of other workers such cases may cause.

The hardest nut to crack for mental hygienists (no pun intended) is the case of psychoneurosis, with whom I will bracket the maladjusted individual. The psychoneurotic is described[8,10] as an individual who is emotionally immature and with a fixation of attention on himself. He is inadequate to meet the disappointments and difficulties of reality and translates them into physical and mental symptoms. Aside from the common symptom of definite fixation of attention on self, there may be various symptom groups.

Worry, excessive fatigue, feeling of inferiority, and fault finding may lead to development of chronic grouches, with vague disabilities frequently recurring, on which, as Dr. Parney says, "is hung the feeling of 'unwell being'."

These cases are a liability to industry because of their lowered efficiency. Their emotional distortion affects the sympathies and disturbs the morale and efficiency of those about them. The remote causes are probably legion in number. They reach back to early childhood and all through the years of growth. They include hereditary predispositions, early psychic education, physical illness, and domestic frictions, and a host of others.

Immediate causes may arise in or out of work as a result of any of the factors just enumerated. Perhaps it may be easier to understand the operation of these causes in the terms of the requirements for healthful mental development.[8,14,18]

I HAVE grouped these in my own mind as the satisfaction of four driving urges or needs which I call the four S's. These can be considered as including all the other necessities for sound mental health.

The drive for Survival: the need for assurance that life for the man and his dependents will continue.

The drive for Security: The need for assurance of a steady job with sufficient pay.

The drive for Self Expression: the need for opportunity to use initiative, responsibility and creative power.

The drive for Self Esteem, and esteem of his fellows: the need for satisfaction in accomplishment.

These basic urges all overlap and frustration or inability to adequately satisfy any of them upsets the mental equilibrium. The degree to which disturbances may result from such frustration depends on the toughness or elasticity of the individual, the intensity of the frustrating factor and the period of time during which the need is left unsatisfied.

It is needless to go into detail, for all of us have experienced the evil effects of frustration of at least one of these needs and I daresay most of us have been fortunate enough to make the necessary adjustment. I daresay also many of us are psychoneurotics even though we won't admit it. It becomes necessary at this point to inquire whether in view of the basic needs mentioned, it is possible to apply a program of mental hygiene to industry. The necessity for such a program is unquestionable because as previously pointed out industry can only function efficiently when the workers are mentally well balanced. Unless industry functions smoothly the welfare of the nation is threatened. This is no idle statement. Hackett points out[11] that "A worker's attitude towards his job determines his efficiency; he may be physically capable, experienced and skilled, but his mental condition often prevents him from being a useful producer. He may indeed be a positive detriment to a plant by his acts and by his baneful influence on others." Such an attitude may be the product of something in his life outside the plant, or may be a result of conditions under which he works. It is not unusual for some circumstances in the same life to be translated into difficulties at work. There are many case histories in industry to show that a threatened divorce, the possible discontinuance of college studies by a child of an ambitious parent, a bad debt, or an unforseen illness in the family, have been responsible for interference with the operating efficiency of workers. The underlying causes were never apparent, and were nearly always translated into disturbance of physical or nervous functions which interfered with work.

Within the plant a number of factors may operate to produce mental disturbance or psychoneurotic manifestations. Among the most important is the element of fatigue. I once knew a doctor who worked so hard while he was taking a post-graduate course that he said he could describe the irritability produced by fatigue only in one way. At the end of the day, he could only scream at his wife and spank the baby. In these hectic days, when industry is urged to speed up its program, there is our ever present danger of attempting to accomplish this by increasing the amount of work and lengthening the hours of labor. Here, too, our industrial hygienists and mental hygienists could profit from the experience in British industry. They have assembled evidence to show that when the pace is speeded up or the period of work is lengthened more than just a trifle, fatigue develops in cumulative amounts sufficient to produce nervous irritability and susceptibility to accidents.[15] The effect is just contrary to what was intended and production slows up. Fatigue may be produced by repeated or loud noises, and Dr. Carey McCord states[16] that "it is clearly established that far more fatigue may be produced in half a minute, if some unusual event takes place, as the bursting of a fly-wheel or the explosion of a centrifugal machine, than would accrue from 10 hours continuous operation under normal conditions." Noise is definitely fatiguing, and nowadays "fatigue is definitely regarded as associated with mental processes and emotional states."

In mechanized operations of manufacture which involve repetition of motion, monotony develops from the inability to vary the rhythm under the compulsion of keeping pace with a moving belt. The worker can't time the movement according to natural inclinations, the rhythm can't be controlled by slowing up a little and then speeding up again. The worker becomes an automaton that fits accurately into the machine. Skill is kept from developing, there is a loss of interest, and when this is kept up for hours at a time at a fixed pace, "there is a weariness out of all proportion to the muscular strain, because the weariness is emotional as well as physical."[2]

For this reason, fatigue and the part psychology plays in its production or prevention is now the subject of researches by Harvard and the United States Public Health Service.

The effects of poor lighting, ventilation and other insanitary conditions are so obvious they need not be gone into.

Conditions of social relationships in the plant itself may set up neurotic manifestations. There are many instances reported of jealousy of other workers setting up a sense of grievance out of supposed favoritism. In one case, a man actually "burned up inside" for so long as a result of not receiving an anticipated promotion which went to someone he thought less deserving than he was, that a refused request for a vacation actually precipitated a nervous breakdown.

IT HAS been reported by various industrial medical men that sometimes a wave of neurotic disturbances will travel through only one department of a plant, and will be reflected in a disturbance of production arising out of the lowered efficiency of the workers in that department. The doctors have learned that this is the cue to call in the personnel director and advise him to withdraw some new ruling or replace a disagreeable supervisor. Not infrequently supervisors and executives themselves may be in need of mental hygiene and personnel troubles disappear when the boss is straightened out by the doctor, re-placed. One other condition deserves mention. In industries where employment fluctuates, the worker may not be rid of his feeling of insecurity even though he may be working, for there is the ever present fear of being out of work tomorrow. In these days of extended unemployment, men grasp at any job in order to live. It may not be the job they are suited to, or may not

pay enough to supply adequately the requirements for the workers and their families, but necessity compels. Under such circumstances, how can the other essentials for mental health and balance be fulfilled? Quoting again from Hackett: "Thwarting the instincts and condemning the worker to a life of limited happiness, restricting personal development and desolation when sick, brings about a state of mind which amounts to an industrial psychosis." When this is applied to large numbers of unemployed as well as those who are working under what might be construed as intolerable conditions the implications become clear. Because today, industry includes not only heavy manufacture but agriculture and other pursuits in which millions of workers live in constant insecurity, the frustrations to which they are exposed for economic reasons undoubtedly are a cause of psychoneurosis.

Hackett goes on to say still further that "those who take the view that every discontented worker is mad may be in need of psychiatric aid themselves. Some workers strike because they are clear thinking enough to discern a just cause and enforce it by drastic action." Because, although "industry has done well in removing the danger of accident, it has done little to remove the fear of unemployment, the financial loss through illness, and the many other troubles that obsess the minds of working men."[11] That such a condition exists is a sad admission. If one considers mental hygiene's relation to industry one must not think only of those employed at the moment, but the mental attitude and mental health of those men who are at present unemployed, desperate and bitter. Because ultimately such neglect becomes a financial loss to the country.

In the face of the developing war hysteria which seems to me, in itself, to indicate a need for a mental hygiene program on a national scale, it is heartening to hear what public health leaders say in a country whose situation is really desperate. In the *Journal of the Royal Sanitary Institute of England*, Alderman David Adams, of Newcastle on Tyne, in discussing one of the published papers, declares that the government didn't hesitate to subsidize industry and business, but showed no concern for the workers. As a result, he further states, their social services are directed to mitigating the effect of that neglect. He says that "in national self-defense the State must make the physical and other standards of the civilian worker its proper concern, and by legislation and administration raise to proper level the standards of life of the people."[12]

I take the liberty of quoting rather extensively from another article appearing in the same Journal, because of its applicability to our own situation here in the United States. Dr. T. O. Garland, an English health officer, points out[13] that the first things provided in the army are measures for proper housing and nutrition. Since industry is also an important part of national defense and its organization is so much more complex than the army, it should lead them in the matter of providing food, clothes and housing for the civilian defense population. Presenting Dr. Garland's concept of the broad view of industrial hygiene, I quote: "If a nation really plans to use its man power at the full potential value,—and no other plan appears to have any sense,—it will give all men work to do. If from some weakness of organization some are held in reserve,—unemployed if you like—their health must still be maintained. Moreover, consideration must be given not only to adult workers but to those who, now children, will be workers of tomorrow." Apropos of telling people what they should do for their health and how they should conduct themselves, he states that "it is an elementary psychological axiom that to be made too conscious of a need that can not be supplied leads to illness. Hence education aimed at the promotion of health, if it is without the essential material support, may actually damage health. . . . It is too often forgotten that energy and initiative, two necessary qualities for good management (in industry) are clearly related to the hemoglobin content, the vitamin intake, and the calorific value of the diet."

WHAT can be done, then, for instituting a mental hygiene program in industries? "By means of general hygienic measures, we can reduce the incidence of many diseases and delay the onset of degenerative conditions. In the same way, though we do not know any specific means of preventing schizophrenia or psychosis or neurosis, we do know about influences which are very unwholesome for individuals who are at all susceptible to these influences,"[17] and we can make an effort to control them. The first steps are now being taken in larger organizations. The industrial physician who works in the plant will be expected to diagnose early all those illnesses and disabilities based on a psychoneurosis or mental disease. Vocational guidance and job placement also play a part in developing healthy attitudes by putting the right man in the right job. Industrial hygienists are making concerted efforts to improve the work environment. There are being established community programs of mental hygiene where mental disturbance cases will be sought out and an attempt made to restore them to normal mental conditions and attitudes. Within industry itself, just as with the more inclusive industrial hygiene program, it is only the bigger plants and organizations which will be able to afford the cost of such a program. The smaller plants will have to rely on governmental community agencies. But at the best these can only modify the immediate environmental problems. The economic and sociologic disturbances which cause employment insecurity, wage insecurity, nutritional, clothing, housing and all other related insecurities,—these are not susceptible to control under present conditions.

The position of mental hygiene and industry and their relation to the present ailing condition of the world are best summed up in the following quotation from a well known textbook of psy-

chiatry. The author says: "Social and economic factors play a part for better or for worse in everything. Prostitution, syphilis, birth trauma, alcholism, drug addictions, avitaminoses. . . . psychoses, industrial accidents and poisonings, suicide, gambling, delinquency, crime—everything! Suffice it to say that in the course of routine psychiatric practice. . . . our social and economic chaos forces upon our attention a new absurdity every day—each as revolting as it is damaging, wasteful, cruel and unnecessary. What a clearance shall be achieved, when, in a more rationally organized society, every able-bodied person shall have a full opportunity to engage in constructive work with resulting security for himself and his natural dependents, we may only surmise. But we have reason for saying that until such a time arrives it will be quite impossible to put into effect a complete mental hygiene program."[14]

Science and industry have made more progress, taken greater strides in the past century than in all the two thousand years previously. But social progress has lagged behind. When individual welfare is recognized as part of national welfare then social progress will have caught up and mental hygiene can become effective.

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Industrial Health Conference

—First Annual Meeting of the American Conference on Industrial Health, November 14, 1940, Chicago—

AS AN expression of the increased interest in the promotion of industrial health, the first annual meeting of the American Conference on Industrial Health, sponsored by the American Association of Industrial Physicians and Surgeons, was held at Chicago Towers Club, Chicago, on November 14, 1940.

The object of this meeting was to get the points of view and reactions of different types of organizations, groups and individuals with respect to cooperation of such groups and individuals in "The Practical Value and Application of Industrial Health Work," which was the subject of the symposium.

A meeting of this kind provided a great deal more information than had previously been possible on a similar subject, because of the fact that it was not limited, as most meetings have been in the past, to the collaboration or participation of merely a few types of groups or persons; for example, in most previous meetings, the employer, the physician and the safety group, have been chiefly the people attending the meeting and contributing to the program.

The meeting was indeed one of "reactions," covering the whole gamut of human reactions, from the experiences of individual employees in their own words, through the experiences of management-supervision in the selection of employees and in the administration of health programs, and of safety, public relations and nursing programs; including the opinions of the physician and the industrial hygienist; the experiences of the insurance company, the legal profession and labor; the financing of industrial health programs; the problems of industrial psychiatry; the accomplishments of past research and the indications for future explorations; the relationship of industrial health and national defense; the humanitarian appeal of industrial health work; the relationship of industrial health work and the general practitioner of medicine, and finally the correlation of such information leading to the raising of standards of health in industry.

Delegates from all over the United States attended the meeting and expressed themselves as being greatly impressed by the importance and national scope of the conference.

It seemed to be the sense of the meeting, particularly with reference to national defense, that industrial health work should be the bulwark of national defense because of the prime necessity for maintaining healthy man power in industry as the background for the supplies and equipment essential to the successful administration of the army, navy and air corps. It was, however, emphasized that industrial health work should not be developed solely for the purpose of national defense, but should be made a permanent national industrial program.

Left to Right: Dr. C. D. Selby, Dr. Leroy U. Gardner, Mr. Ralph L. Lee, Dr. Lydia Giberson, Dr. D. L. Lynch, Mr. Ambrose Kelly, Dr. Carl M. Peterson

The sponsoring organization, American Association of Industrial Physicians and Surgeons, has as its component societies the following groups: Central States Society of Industrial Medicine and Surgery, Association for the Advancement of Industrial Medicine and Surgery. Michigan Association of Industrial Physicians and Surgeons, New Jersey Association of Industrial Physicians and Surgeons, Association of Railroad and Industrial Physicians and Surgeons of Kansas City, Georgia Association of Industrial Surgeons, Milwaukee Association of Industrial Physicians and Traumatic Surgeons, and Hawaiian Society of Industrial Physicians and Surgeons.

The collaborating organizations which rendered valuable assistance and promoted interest within their own groups were: National Association of Manufacturers; American Industrial Hygiene Association; Industrial Management Society of Chicago; Illinois Manufacturers' Association; The Greater Chicago Safety Council; American Foundrymen's Association; Casualty Adjusters' Association of Chicago; National Founders' Association; Division of Industrial Hygiene, Illinois State Department of Public Health; Health Department, City of Chicago; Chicago Industrial Relations Association; American Mutual Alliance; National Small Businessmen's Association (Chicago Unit); National Metal Trades Association; Bureau of Conservation, National Association of Casualty and Surety Underwriters and National Association of Casualty and Surety Executives.

The program committee in charge of arrangements were the following: Co-Chairmen, Edward C. Holmblad, M.D. and C. O. Sappington, M.D., Dr. P.H., and members, Volney S. Cheney, M.D., F. P. Hammond, M. D., F. W. Slobe, M.D., J. A. Valentine, M.D. and H. A. Vonachen, M.D.

The program was as follows:

Morning Session:

DR. C. D. SELBY, Medical Consultant, General Motors Corporation, Detroit, *Presiding:*

From the Viewpoint of:

The Employer—Mr. B. C. Heacock, President, Caterpillar Tractor Co., Peoria, Ill.

The Physician—Dr. William A. Sawyer, Medical Director, Eastman Kodak Company, Rochester, N. Y.

The Industrial Hygienist—Mr. Warren A. Cook, Zurich Insurance Co., Chicago.

The Employer—Mr. D. A. Moore, Western Electric Company, Chicago.

The Insurance Company — Mr. Ambrose Kelly, American Mutual Alliance, Chicago.

The Legal Profession — Mr. Frank Peregrine, of Peregrine and Bruegger, Lawyers, Chicago.

Labor — Mr. Matthew Woll, Secretary, American Federation of Labor, New York.

Luncheon Session

DR. C. O. SAPPINGTON, Consulting Industrial Hygienist, Chicago, *Presiding:*

"The American Conference on Industrial Health"—Dr. Volney S. Cheney, Medical Director, Armour and Company, Chicago.

"Industrial Health and the National Defense"—Dr. Paul A. Neal, Chief, Division of Industrial Hygiene, U. S. Public Health Service, Washington, D. C.

Afternoon Session:

DR. E. C. HOLMBLAD, Medical Consultant, Railway Express Agency, Chicago, *Presiding:*

From the Viewpoint of:

Employer-Employee Relations—Mr. W. E. Odom, W. E. Odom Associates, Chicago.

Finance and Cost Accounting—Mr. A. W. Torbet, C.P.A., of Frazer and Torbet, Chicago.

Selecting the New Employee—Mr. A. G. Trembly, Chicago.

Safety—Mr. J. D. Berman—Director of Health and Safety, Western Electric Co., Hawthorne Works, Chicago.

Public Relations—Mr. Ralph L. Lee, Department of Public Relations, General Motors Corporation, Detroit.

Nursing—Miss Joanna M. Johnson, Supervisor of Nursing, Employers Mutuals of Wausau, Wisconsin.

Research—Dr. Leroy U. Gardner, Director, Saranac Laboratory, Saranac Lake, N. Y.

Industrial Psychiatry—Dr. Lydia Giberson, Metropolitan Life Insurance Co., New York.

Dinner Session:

DR. D. L. LYNCH, President, American Association of Industrial Physicians and Surgeons, *Presiding:*

"Industrial Health and the General Practitioner"—Dr.

MORRIS FISHBEIN, Editor, *Journal of the American Medical Association*, Chicago.

"The Humanitarian Appeal of Industrial Health"—MR. M. J. CONWAY, National Association of Manufacturers.

From the Viewpoint of:

The Employer

B. C. HEACOCK,
President, Caterpillar Tractor Co.,
Peoria, Illinois

WE ARE occasionally told that the employer of today is a hard-headed and a hard-hearted business man who does all his thinking in terms of dollars and cents. Perhaps some of us are a bit hard-headed. Others would call it practical. But when they say the average employer has a heart of stone, and a soul of dollar signs, they are making an accusation that is absolutely false. I can think of no better proof than the motivating force which has inspired employers to pursue a program of industrial health.

It is unquestionably true that an industrial health program can be justified from a standpoint of dollars and cents, but I am sure that most employers seek benefits primarily of a human, rather than a monetary nature. The purpose of a health program, after all, is not to make money but to make health. Any financial advantage is essentially a by-product and must always be recognized as such.

We humans are odd creatures. Most of us are more concerned with other people's health than we are with our own, and while we encourage the other fellow to seek medical attention and advice we are apt to completely overlook the possibility that we too might benefit through the medical profession. Left to our own devices, we are prone to stay away from the doctor until we are just so doggoned sick there's nothing else to do. You in the medical profession are most familiar with this human fallacy, but despite it you have made great strides in the direction of preventive medicine. An industrial health program is just another step in that same direction.

Quite recently our company inaugurated the practice of having key men in the organization examined at least once every year. Those key men have the option of obtaining their examination from their own physician or from our medical director, but in either event a follow-up system is employed to make certain that the examinations are undertaken at regular intervals. The reception of this plan has been most enthusiastic—99% choosing to be examined by our own medical director—and yet I am convinced that many of the men will receive their first complete examination in years. Isn't it strange that it would take a health program to make us seriously contemplate our own well-being?

Why we inaugurated the practice of having key men periodically examined is quite obvious. It wasn't out of curiosity but out of interest. As a result of these examinations we are sure the men themselves will benefit by being in a better position to safeguard and improve their own health. However, the company has no desire to learn the outcome of these examinations, as that is a matter of strict confidence between the individual and the examining physician.

NOW let us consider the more general aspects of an industrial health program. A man applies for work and is given a complete physical examination. He talks to a competent physician, watches him at work, and learns to have confidence in his ability. If he has any physical ailments, he is told what they are and advised to consult his family physician to secure the needed treatment. Perhaps this man had never had a complete physical examination before. Perhaps he thought he was in perfect health, while all the time a disease was gaining a firm foothold in his body. He is informed of his own bodily weaknesses and given a chance to add many healthy and happy years to his life.

He sees medicine not only as a profession that seeks to cure but a profession that seeks to prevent. The physical examination has given him a real incentive to improve his own health, and at the same time has given him a more clear-cut impression of what the medical profession is actually in a position to accomplish. He sees medicine in its true light, perhaps for the first time. Equally important, he carries this attitude to his family, to his neighbors and friends. They carry it to others.

The purpose of a pre-employment examination is not to bar those with physical defects, but rather to place men in work for which they are physically fit. It has been our practice not to deny employment unless the applicant has a contagious or a communicable disease, or is in such physical condition that employment would be dangerous to himself or others. Even those with a venereal disease are considered employable, providing the disease is not in a contagious stage and providing there is no evidence of neurological symptoms. Industry has to accept its share of less-than-perfect applicants and strive to make them useful employees.

But an industrial health program is far more than a pre-employment physical examination. The man who works does so where medical care is always available. He learns to rely upon medical attention and learns the importance of prompt and expert care. He finds that the doctor and nurses are interested in him as an individual, and that his troubles are retained in strict confidence. In the plant newspaper he reads special articles written by the doctor that are full of useful information. He finds himself drawn more closely to the doctor and nurses, finds himself more confident in what they can do for him, and more willing to seek their advice and attention.

A number of years ago it was apparent that the men in the shop viewed our medical program with a little suspicion. They had to be convinced that

the program was for their benefit and not some sort of sinister scheme to weed out those who failed to measure up to physical perfection, or those who applied for first aid too often. The proof was in the eating of the pudding, of course, and there has been a healthy change of attitude.

Just the other day one of our nurses told me with a great deal of affection that she had a grand bunch of fellows in her area, and that she really enjoyed treating them. She said that the men are no longer reluctant to receive first aid, and that as far as she knew they were generally willing to follow her advice. She told me of several little incidents which in themselves were insignificant, but which nevertheless revealed a growing confidence in our medical program. A properly administered health program can go a long way in stimulating employee good will.

To the man working in industry, an industrial health program is a realistic incentive to protect his health through medical assistance. And yet the influence of an industrial health program does not start and stop with the employee. It starts there, yes, but it doesn't really stop until it has had its influence upon the community and the nation as a whole. Its influence spreads out in all directions, like a great fan, and wherever it spreads health benefits.

We have every reason to believe that our own medical program, which serves more than 11,000 employees, has materially influenced the health standards of our community.

I have tried to sketch what an industrial health program means to the man. It means exactly the same to his employer, who views the program not as a means to better profit but as a means to better living.

It is unfortunate that some firms haven't fully considered the benefits to be derived from a health program. Too many, I am sure, still look upon a health program as an expensive device that can be afforded by only the larger companies. Actually, if a firm can afford to stay in business, it can afford a medical program, whether it employs six or six thousand. We would have to look a long way before we could find an investment that is sounder than an investment in health.

CONSIDER, for a moment, the financial side of an industrial health program — the by-product to which I have already referred. Any program that benefits health cannot help but benefit in many other ways as well. Let's consider just a few of these other benefits—the most obvious ones.

THERE IS LESS LOST TIME—Men learn the value of preventive medicine and when distressed are quicker to seek medical attention. Men with contagious diseases are kept home, and by prompt action epidemics are curbed. There are fewer illnesses because health is guarded. As a result, there is less lost time. Lost time, of course, costs both the employee and employer money, and a diminishing of lost time represents a real saving.

THERE ARE REDUCED ACCIDENTS—Men who are not in good physical condition are the most likely accident candidates. They are less alert, their reactions are slower, they are less willing to take precautions, and their weakened condition in itself is hazardous. Accidents are expensive, and a reduction in them not only reduces human suffering but also reduces costs.

THERE IS GREATER EFFICIENCY AND COOPERATION—Certainly, improved health also means improved work. Health has a direct bearing upon attitude and performance, as we all know, and as health standards go up the degree of cooperation likewise goes up. The man who is in poor physical condition is neither likely to do good work nor get along well with the other men. He tends to be indifferent, temperamental, tactless and dissatisfied. His physical condition may not only affect his own work but the work of many others. So here again a health program pays substantial dividends.

There are other, less tangible, benefits which are also worthy of mention. As well as building healthy men, an industrial program builds healthy good will and very definitely improves employer-employee relationships. I am sure that the more time a firm devotes to a medical program the less time it will have to devote to misunderstandings.

The small employer, of course, need not buy a lot of expensive equipment and hire a staff of physicians. Perhaps it would be sufficient to make an arrangement with a local doctor who could conduct the pre-employment examinations and serve in other part-time ways. The local doctor, in such an event, should be familiar with industrial problems or eager to become familiar with them. But no matter who performs the examination — whether it be a local doctor or a plant doctor — it should be a complete examination, and not a hasty check-over. No examination whatsoever is perhaps better than an examination that is incomplete. Certainly no man should be left with the delusion that he is in perfect health, when he is actually suffering from diabetes, early tuberculosis or any other condition which would be hazardous to both himself and fellow employees.

A health program, however, is not simply a matter of securing the services of a competent physician and nurses. That is just one phase of the program, although admittedly an important one. The other phases involve working conditions, heat and ventilation, production standards, sanitary toilet facilities, luncheon facilities, and many other factors that are too numerous to mention but which nevertheless directly influence the maintenance of health. Even the most completely staffed medical department would face a hopeless task if the entire management, from top to bottom, did not actively and intelligently participate in the program.

I say that a properly administered health program is just as good an investment for the small employer as it is for the large. But disregarding costs and financial benefits, it seems to me that an industrial health program is primarily worthwhile

because its objective is human betterment. Even though we should fail to justify it on our profit and loss statement, we still owe it to ourselves and to our community to justify it purely out of human consideration. What more could we ask than an opportunity to improve the health and happiness of our lot?

From the Viewpoint of:

The Physician

WILLIAM A. SAWYER, M.D.,
Medical Director, Eastman Kodak Company, Rochester, New York

THE purpose of industry is to make those things which are desired and needed by mankind. Good machines, the best of materials, and efficient labor are the basic triad of a thriving manufacturing enterprise.

It has been said again and again that success of any organization rests squarely on the shoulders of its personnel. Doubtless we all agree that man power, with all the term implies, is the most important single factor in the industrial world. Therefore, everything possible should be done to insure the highest possible efficiency of that personnel. Its health and well being determines in large measure its effectiveness on the job.

No business can genuinely prosper today that does not follow the fundamentals of sound personnel management: the best selection, training, placement and handling of men. Men must feel they are an important part of the organization and that the management has their welfare at heart. The development of a well integrated, contented working group is as essential as the planning of the type of product to be made and the selection of materials to go into it.

Since men are so vital in the scheme of things, proper attention to their health is of primary importance. The physician trained in industrial medicine can be of great help in selecting and maintaining healthy personnel. We all know that a worker is not at his best on the job with even a slight ailment. A toothache, sore throat, upset stomach, any ache or pain, may so impair his productivity that he is more of a liability than an asset. Accidents often happen as a result of such slight ailments. Early attention to these seemingly inconsequential symptoms makes for safety, good health and better workers.

You may well ask, why medical service is of value in industry? To be sure, what I have to say is from the viewpoint of a physician. I began my professional work in the field of surgery. However, from my earliest recollections the preventive aspects of medicine appealed strongly, and when the opportunity came to go into industrial medicine with its possible programs of prevention, I grasped it gladly. I believed then, 25 years ago, and I believe more certainly now, that the greatest single opportunity in industrial health work is the prevention of sickness and disability.

The results of this are not always immediately evident or direct, but in due time the score is decisive, if the game is played according to the best rules. I know of no field of medical effort where the chances of preventive work are greater. And so, throughout our discussion, I want to emphasize the preventive possibilities in medical health service. Preventive medicine is looked upon as the highest form of medical science. To prevent sickness and disease, to prevent disabling conditions which all too often keep men from active work, and to prevent inefficiency in work, are goals worthy of the best professional minds and skill.

Now as to the opportunities for preventive medicine in industry.

Pre-Employment Examinations

I WOULD list as pre-eminent in industrial medical service the pre-employment examination. Such an examination can be made a valuable instrument and a preventive, for not only the employer but the employee and community as well. In one of our applicant groups of 4,640 presumably healthy adults 25 (or 0.5%) individuals were rejected because of active or clinically significant tuberculosis. In this group of 25, after the pre-employment examination, five entered a sanatorium, and 10 were examined and followed by a sanatorium. We were unable to get information concerning the remaining 10. To discover and control 15 cases of tuberculosis protects a large group of individuals in a community and obviously is far reaching in its reduction of sickness.

Emphasis needs to be put on the benefit to the worker. This has been too often overlooked. Unfortunately there are a great many who still believe that a pre-employment physical examination is merely to reject a man for employment, a clever method of eliminating certain undesirables. They do not stop to find out that it can be not only of the greatest benefit, but insurance for the future to both employer and employee. To be sure, I am speaking of a properly conceived and executed examination, one in which the applicant for a job is treated like a patient in a private practitioner's office. The examination should be conducted with every reasonable degree of privacy, and time should be taken to explain adequately the findings of the examination. Advice should always be given so far as possible as to what course to follow to correct any defect found.

Rejections are never inconsequential. They are often tragedies, but even under the most unfortunate circumstances some help can be given in the way of explanation and advice. The rejected individual can sometimes have a condition corrected and later be passed for employment. When considering the problems of rejecting applicants, we should keep in mind the per cent rejected. Under average conditions throughout

industry not more than 5% need to be rejected because of physical defects.

In passing upon the suitability of an applicant for a job, the doctor should be guided in his judgment by job specifications, carefully developed as the result of thorough job analysis. If the doctor is not fully acquainted with the shop, its work, its hazards, environment, employment and production needs, he is not as fully prepared as he should be to practice real industrial medicine. In all industrial medical work, co-operation with the plant employment and safety departments is absolutely necessary. The doctor should realize that he is an integral part of the organization, doing his share to help with the production and success of the company, quite as much as supervision generally.

Pre-employment examinations have many advantages for the prospective employee. They tell him and his employer where it is safest to work. They are a protection and safeguard. In 1939, 336 applicants for employment were checked by an oculist because their vision was defective in the preliminary examination. Of this group 15 were found to have amblyopic eyes. It was necessary to reject nine because the jobs for which they were being considered were hazardous. The remaining six were employed on non-hazardous jobs. If these individuals had not been examined, they might very well have been employed for hazardous work which would involve not only their safety but that of a large group of employees.

In a pre-employment examination we can do an inestimable amount of good by detecting disease in its incipiency, giving advice as to ways of correcting unfavorable conditions and avoiding others, thus making a friendship between the plant health service and the employee. The first contact with the medical service should make the prospective employee realize that the medical department is a place where he can depend upon genuine helpfulness and consideration. If he is properly treated, he will feel free to return when it is necessary. Not only should the doctor keep in mind the possibilities of preventive medical work, but also the immense amount of employee good will which can be developed through such contacts. No greater opportunity offers itself than this initial meeting between the doctor, the nurse and the employee. That is why the right doctor, the right nurse and the right technic are deserving of such careful consideration.

Periodic Examinations

FOLLOWING this first physical examination there are many other occasions during employment when a worker should be examined. If possible, there should be periodic health examinations performed regularly. Irrespective of how often they are done, an occasional check-up to discover bodily conditions which are inimical to safety, good production, and good health, is a wise precaution. Such examinations help to prevent illness, and according to life insurance statistics, prolong life. They are especially worthwhile in the older age groups where so often a worker slows down and does poor work because of unsuspected changes in his physical condition. Perhaps the greatest good comes from periodic examinations, made on employees exposed to hazardous working conditions. Surely there is no better check of a dusty job than a regular physical examination to determine whether the individual exposed is being harmed. Also such examinations prevent many unjustified claims as to injury. There is likewise some evidence to show that periodic examinations which uncover physical defects are the means of preventing accidents. So altogether they are a "Safety-first" preventive measure.

Partial Examinations

CLOSELY allied to planned periodic examinations are the many partial examinations, done upon request when an employee voluntarily visits the medical department, because of some ailment or symptom. He does not feel quite right, there is some discomfort or change which bothers him. At such a time, an effort should be made to determine the cause. Sometimes it is of no moment, in which case, the employee's mind is relieved by an examination, and he is as much benefited as though some clear-cut malady had been discovered and cured. If some condition of real importance is found, advice can be given as to its treatment. In the treatment of major conditions every effort should be made to persuade the employee to consult his family physician or, if he has none, to see that he puts himself under good medical care. Working in this way, with the private practitioner and hospital, makes for good feeling and does a real service to the employee.

There are many interesting angles to this problem of helping the worker discover what is wrong when he feels below par, but time does not permit a real discussion here. It resolves itself into a genuine friendly interest in the individual, remembering the obligation to the family physician, and a follow-up to see that he has really done as he was advised. People generally are careless about following through in treatment and the doctor in industry can do much to supervise and control the outcome. The private practitioner is usually glad to have the interest of the plant doctor. Together they can solve more problems than working separately. If medical service in industry is conducted on a high grade basis, with square shooting on the part of the plant physician, the medical profession outside the plant will cooperate. It is to their advantage to do so. Good medical service and good health attainments in most communities result from a combination of efforts by the private practitioners, public health officials, hospitals, and physicians in industry. Where they all appreciate this and pull together, the most outstanding accomplishments are possible.

In many of the larger industries today, great strides are being made in the early detection of

many diseases. In employed groups there is a better opportunity to make mass surveys than in almost any other place. If complete periodic examinations cannot be made, then anyone or more of the following may be done with advantage to all concerned: a blood Wassermann, a chest x-ray, a tuberculin skin test, a blood pressure reading, a urine examination, a hemoglobin test, eye examination, or at least a weight recording. Thus early syphilis, diabetes, kidney or bladder conditions high or low blood pressure, anemia, tuberculosis, defective vision, and overweight or underweight are easily detected. A program in which any part of this is done is extremely valuable.

Small plant managers should not feel that because they cannot inaugurate complete medical service they will not undertake anything. Physical examinations of all new employees can be the first step. Then perhaps examination of all present employees. It is not a question of prohibitive cost; it is a matter of interest in a preventive scheme, and a will to give it a trial.

There are, of course, other opportunities for periodic examinations of a sort. In some organizations, it is required that whenever an employee is promoted or given an increase in pay, he must submit to a physical examination. This has a great deal of merit. Also when there is a transfer from one job to another, examinations are indicated. Especially is this true if any hazard is involved. Again it is a matter of the doctor knowing the job and what it requires in the way of physical qualifications.

Keeping employees fit so they can stay on the job and not have to go home is another important part of health service. Treating their minor ailments, such as headaches, upset stomachs, colds, etc., is justified. You are not infringing upon the work of the private practitioner, because employees usually treat themselves, go to the drug store or go without. We have heard not infrequently, "If I could not get taken care of here, I'd have to go home." It is one of the many phases of medical work in industry which we know is really appreciated. Wise treatment in the plant, with every effort not to miss some serious condition, is distinctly advantageous.

Reduction of Sickness and Accidents

ALL of these endeavors to discover disease and abnormalities which lead to disease will inevitably and eventually reduce lost time due to sickness. As has been indicated before, this is an advantage to all—the employee, employer and the community. It is of public health value as well as of individual benefit. We must not overlook the fact that in many respects medical service in industry is a definitely profitable support to community health efforts. It has always seemed to me that we should not be limited in our conception of the usefulness of the thing about which we are talking. Health work in industry is more and more attracting the attention of national, state, and local health officials, and there is every prospect that from these officials an increasing amount of attention to it will be given. If we are determined to make the health average of our communities better, we must develop team work amongst all groups having opportunities to improve the situation. Industrial medical service is a necessary form of health enterprise, and will become in some respects quite as important to public health programs as anything they now do.

Accidents

WE ALL know the records that have been attained in reducing accident rates—both as to frequency and severity. In one organization since 1910 they have reduced the number of accidents 92.5%. This is typical of records in many places. A great deal of time and money has been spent in doing this, but no one would say it has not been profitable. Of course, the medical service has by no means been responsible for this, but the influence and service of the doctor have been a factor.

The care of the accident cases is taken for granted these days. It is too generally thought that all that is necessary is to call a doctor or send them to the hospital, but it is more than just surgery. There are some elements in this sort of thing, born of experience, which, if followed carefully, contribute mightily to the early recovery, with a minimum of physical and mental disability. And do not think this unimportant. Despite the splendid records made in eliminating the number of accidents, there is still a great deal to be done in restoring those injured to useful and remunerative work, with a minimum of mental upset.

The promptness of caring for the one injured is very helpful. Small things, such as immediate notification of the man's family, taking his family to the hospital, reassuring the family and making certain they will not want for anything during his incapacity are, of course, only matters of good employee relations, but unfortunately so often forgotten. It eases the mind of the injured worker, all of which helps in his recovery. Attention to such details is proof that the firm for which he works really cares, and if there is ever a time when he needs a friend, it is when he is hurt. Then there must be frequent visits by the doctor, possibly a visiting nurse if there be one, and certain other key individuals in the organization. These keep up morale which in turn benefits treatment. Early return to the job, even if it is only for part time or light work, is good. This helps in preventing disability of both body and mind. Such a program in handling accidents reduces lost time, loss of wages, compensation costs, functional disability and ill-will toward the management.

Sickness

FEW of us would consider the efforts spent in reducing accidents as unwise or unprofitable. Why therefore should not the same effort be put into reducing the amount of sickness? In one instance time lost by illness was reduced by 44%.

This lowering of the sickness rate was very largely the result of efforts by the medical service. It is the sort of success which can be attained anywhere if a proper set-up is put into operation.

In view of the fact that there is 10 to 15 times as much lost time from sickness as from accidents, shouldn't there be more well-organized attempts to prevent the amount of illness? If there is any kind of a sick benefit system in effect with good records, it is easier to measure the effect of preventive procedures. Some of the most striking and best appreciated accomplishments of medical service in industry have been made in reducing the amount of illness amongst the employees. It is convincing to be able to show that there is less absence, less sick benefit paid out and less loss of regular wages over a period of years. I firmly believe that any industrial organization can determine its own sickness rate by the program of medical service it develops and operates.

Health Education

IN recommending a program of health education, I do not refer especially to printed material of one sort or another, valuable as that is. It seems to me that one of the biggest and best opportunities for teaching better hygiene, and more intelligent understanding of what causes illness, is in the frequent contacts between employee and doctor, and employee and nurse. Everytime that an employee is asked to visit the medical department for an examination or a check-up of any kind, or that he comes of his own choice to ask a question, is a potential educational opportunity. The fact that he comes shows he is interested and when you have his attention you are in a favorable position to teach. In our organization last year there were 201,771 contacts between employees and the staff of the medical service. If, in only half of these instances let us say, a bit of good information was given, or a service was rendered in such a way as to convince the recipient of some fact about healthful living, think what the sum total might be over the years. Especially in the physical examination, is there a rare opportunity to put across a health message. You have the individual when his mind is sufficiently on the subject so that he will listen attentively.

Therefore, I argue that doctors and nurses in industry should possess the teaching urge and never miss an opportunity to enlighten the employee. This too prevents illness and lost time. Other forms of health education should, of course, be employed.

Industrial Relations

I RECALL a plant manager we once had who always spoke of the medical service as employee lubrication. He considered it such a vital factor in good employee relations that he always thought of it in terms of how much smoother it made employer-employee relationships. I am convinced that there is no more potent influence in this regard than good health service conducted in the right spirit. Perhaps we ought to consider for a moment what it is that makes that right spirit. I will tell you what I think it is. It is the attitude and conviction that emanates from the top of the organization and is passed on down through all of supervision, and that says, "we provide this medical service because it is right and good, and if rendered in the proper spirit, can be most helpful and beneficial. We are interested in our employees. We know that if they keep well and have good medical service when sick or injured, they will be happier and better workmen. If it benefits their work, it benefits them. Our employees are important in their jobs. Good health is their biggest asset. We all need all the help the medical profession can give us."

If top management does not wholeheartedly endorse such service, then the service will never amount to a great deal. If the executives at the top *do* wholeheartedly believe in it, and are interested enough to make the doctor responsible to them, so that they may be close to some of the details of this most important link between themselves and the workers, then all the great possibilities of what can be accomplished will be realized. After all, the service is but the shadow of the one who directs the organization as a whole.

From the Viewpoint of:

The Industrial Hygienist

Warren A. Cook
Division of Industrial Hygiene and Engineering Research, Zurich General Accident & Liability Insurance Company, Limited Chicago, Illinois

NEVER before has the need for maintaining high health levels been so urgent; and never before has the industrial hygienist been so well equipped to combat occupational disease hazards and to further industrial health.

The industrial hygienist has an important part to play in the practical and economic achievement of better health levels among the workers of the country. It is my purpose this morning to outline briefly the procedures at his disposal for accomplishing this aim, to indicate something of what has already been done through his services, and to point the way whereby greater value may be derived from this somewhat new arrival on the health battlefront.

First, let me present the problem as seen through the eyes of the industrial hygienist, and, I should possibly add, the eyes of an industrial hygienist who has just been exposed to a Symposium on National Defense and Health.

Part of Industrial Hygiene

FOR the duration of the present national emergency, and, I find, the further east we go, the more emergent the situation appears to be, econo-

mic production must necessarily be a controlling factor. The world today is being swayed by the capacity of nations to produce with the men and materials available to them; the world of tomorrow at war or at peace will continue to be vastly influenced by their capacity for continued economic production.

In this country where, for the most part, we have the vital raw materials, the capacity for economic production depends upon our man power. With alert, intelligent man power, we can produce machines to manufacture the necessary goods,—we can even produce certain raw materials such as rubber which are customarily found only beyond our boundaries.

Man power, then, is the basic ingredient in maintaining economic production in this country. But it is not enough that this man power be sufficient in quantity alone, the individual persons furnishing the man power must be on their toes both physically and mentally: they must be well.

The part of the industrial hygienist in maintaining a high health level among the nation's population is limited to certain specific phases of the entire problem and to a portion of the entire population. The industrial hygienist is largely concerned with environmental conditions under which the working population carry on their occupations and the manner in which the work is done in so far as it concerns health.

In order for the industrial hygienist to carry out his function completely it is required not only that he assures that operations are not adversely affecting the worker's health, but that all the costs of the several methods of conducting a unit operation with positive safeguard against injury to health are included in the selection of the optimum method. Only by giving full weight to all these costs can greatest economic production be achieved.

Let me give you an example of the part of the industrial hygienist in the choice of optimum method of operation.

A rubber goods manufacturing concern is given a contract to make rubber boats for emergency use in Navy airplanes. The Navy includes in the specifications the properties of the rubber cement to be used in the construction of these boats. To give you the situation as it actually occurred, the manufacturer set up his operation without benefit of prior consultation with anyone versed in keeping exposures to volatile solvents within safe limits.

He purchased a rubber cement made up with the excellent solvent, benzol. This worked exceedingly satisfactorily and both the cement itself and the cemented product met Navy specifications. But the manufacturer had not, in this case, heard that, some few years before, a group of women engaged in a similar operation had developed the symptoms of benzol poisoning, that several of them had become disabled as a result of these symptoms. Nor had he heard that methods were available to indicate the amount of benzol vapor being breathed by these girls or, in all probability, that benzol vapor might cause injury to the health of his workers, to say nothing of a knowledge of the concentration of benzol vapor in air which might produce such injury.

It happened that, as a result of just such a meeting as this, the rubber goods manufacturer learned that the operation might possibly cause some harm and that there existed a factual sort of person, known as an industrial hygienist, who could, without interfering with the even course of the day's production, obtain information on the amount of the vapor in the plant air and who would interpret his results in terms of relative safety or danger to the health of the workers. The manufacturer in this plant knew the workers by their first names—it was not a large plant—had an honest regard for their welfare and, besides, did not wish to incur any loading of his insurance rate incident to occupational disease losses under the workmen's compensation act. So, with just a twinge of apprehension over possible untoward consequences, our benevolent yet hard-headed business man called in an industrial hygienist.

The industrial hygienist came to the plant bright and early armed with a case containing some small glass tubes filled with activated charcoal—the type used in gas masks. There was also a length of rubber tubing and a fractional horsepower motor connected to an air pump.

After observing operations for awhile, he started the motor and held the sampling tube for half an hour at the breathing level of the workers as they carried on normal operation. A number of such air samples were taken to represent the various types of work being conducted. After taking a small sample of the rubber cement, the industrial hygienist packed up and left.

On return to his laboratory, he weighed each tube on an analytical balance and, by subtracting its weight from that found before the plant air was passed through, calculated the concentration of benzol vapor in air breathed by the girls as they carried on their various operations. These concentrations were found to be 150 to 290 parts of benzol vapor per million parts of air.

A report of these results was discussed with the manufacturer. This report included not only the actual results and conditions under which they were found but also an interpretation of these results together with suggestions for safe methods of operation.

Since it is necessary to keep average concentrations of benzol vapor at less than 100 parts per million, a continuation of the existing process with benzol as the solvent would require the installation of an exhaust ventilation system in order to reduce the exposure to this vapor to safe limits. On the other hand the operation could be carried on without the cost of installation and operation of an exhaust system provided that a petroleum distillate such as gasoline could be used instead of benzol as the solvent for the rubber cement inasmuch as vapor concentrations in the order of three or four hundred parts per million would be entirely safe. A rubber cement with such a solvent was found

which would satisfy Navy specifications. Since the petroleum distillates do not dissolve as much rubber as does benzol it was necessary to use somewhat more of it, but the operation cost was less with the substitution of the less harmful solvent in this case than it would be with the continuance of benzol and installation of an exhaust ventilation system.

Other cases could be cited where the more injurious of two materials is continued in use to greater economic advantage, including in the cost accounting the provisions for protection of the operators against injurious exposure.

In the foregoing example which has been presented in some detail to show how the industrial hygienist works on one of the more simple problems, it would have been preferable if the manufacturer had considered the health aspect of the operation before rather than after production started. As it was he ran the chance of development of injury to health of the employee and, had ventilation been necessary, its installation would have interfered with operations.

The point of view to be engendered on the part of the industrialist is that observed by a large manufacturer a few years ago when it was demonstrated to him it was more economic to pull trucks of material about his plant with gasoline tractors rather than with the electric storage battery tractors then in use. Before signing the purchase order he called in an industrial hygienist. Carbon monoxide gas was of course the potential hazard in this case. The industrial hygienist noted the actual concentrations of this gas in the air while one of the gasoline tractors was operated in the more confined areas in the plant. To obtain this data he held the intake tube of a carbon monoxide indicator at the breathing level of the operator of the tractor and of workers in the vicinity of it. The indicator, which operated on a storage battery integral with the easily portable apparatus, showed the number of parts per million of carbon monoxide directly on a dial. Carbon monoxide was present as a constituent of the gas coming out of the exhaust pipe, to be sure, but the amount was sufficiently small so that, under actual operating conditions in the individual plant, no injury to health would occur.

However, it was recommended that a further check be made after the tractors were in use for some time since a different carburetor adjustment might alter the amount of carbon monoxide produced. This was also done and again the concentrations were found to be sufficiently less than 0.01%, the generally accepted safe limit, to indicate absence of any health hazard from this source at this plant.

Practical Procedure for Avoiding Occupational Disease

IS THERE a practical procedure which the industrial hygienist has to offer to the manufacturer which will virtually assure avoidance of development of occupational disease? With the exception of dermatoses, which like death and taxes will be always with us, such assurance can be afforded provided that proper attention is given to materials being used, the operations in which they are employed, and the men conducting the operations. With few exceptions, any actual case of occupational disease which develops at this time is an admission of failure to utilize the methods of prevention now available.

The first item in this practical procedure for avoiding development of occupational disease is to know your materials. You know their physical and chemical qualities in so far as these facts enter into specifications for your operations. Become informed also on their toxicological qualities. Make a list of all those materials which may be injurious to health if exposure to them becomes too great. Since a myriad of new materials is being utilized in industry today the purchasing agent should be instructed that, as new materials are being purchased, those which may have toxic properties should be added to the list. The second item is to obtain information on the toxic properties and possibilities of injury to health presented by these materials. Exposure to a sufficiently high concentration of ethyl alcohol in an industrial atmosphere will cause poisoning although this rarely occurs in industry. Both these facts should be known together with a comprehension of what a "sufficiently high concentration" means when applied to the material under consideration.

Methyl alcohol or wood alchol is recognized as a potentially injurious solvent by most of us, but since it may be economically advantageous to use this material in certain processes such general facts should be known as that there is no considerable discomfort on exposure to injurious amounts of this solvent vapor and such specific facts as that evaporation of more than 0.34 oz. of this solvent in a room of 1000 cubic feet will produce a concentration which may cause occupational disease—and you should know the short cut method of calculating similar data for such other solvents as you may use.

The third item is that the necessary data be obtained on the extent of exposures to these potentially injurious materials as they actually exist in your plant. By extent of exposure we refer both to duration and concentration. Certain operations on mere observation are obviously not injurious or are adequately controlled. Others are obviously unsatisfactory and control measures should be instituted without delay which might be incurred to determine the concentrations of the injurious material in the air. However, it often helps to direct the most economic solution of a health hazard to have data available on the amount of material disseminated at various locations and under varying conditions. Also it is of value to have a measure of accomplishment by making determination of concentration both before and after control measures have been instituted.

There are frequently a number of border line conditions where even an experienced man cannot state with certainty whether an exposure is bad enough to justify expenditures for control or

good enough to consider if no occupational disease case has become apparent, that none will. In such a situation, some concerns make a practice of instituting control such as installation of exhaust ventilation, substituting less injurious materials, or putting enclosures around the operations just to be on the safe side. Such action is obviously laudable. There can be no criticism from a public health point of view, but what of the requirements of economic production today? Certainly from the economic point of view it is much better to make determinations of the extent of the exposure and find out before the expense of control is incurred whether that control is or is not necessary. Methods for determining concentrations of all injurious materials found in industry are available to the industrial hygienist. Methods have been developed for many of these materials whereby the plant engineer or the plant chemist can obtain the necessary results without difficulty.

The actual control of excessive exposures is the fourth item in assuring prevention of occupational disease. Although it is not appropriate to go into the technical measures for control of health hazards before this audience, I do wish to point out that exposures can be reduced not only by changes in mechanical equipment and in process but that even a mere change in the procedure by which a job is carried on will measurably affect the man's exposure.

As a case in point, a molder's helper in a foundry was vigorously engaged in shoveling sand, which had not been properly dampened, through a sand cutter. His exposure to dust of the type and size to produce silicosis was 43 million particles per cubic foot of air. The recommended limits for average exposure to such dust is 15 million particles per cubic foot of air with maximum exposure not to exceed 30 million.

Another worker in the same plant, two days later, was conducting this same job under similar conditions. He did not jab the shovel into the pile quite as viciously but did the job about as quickly. He had used moisture more effectively and not only gave the molder a more uniformly dampened pile of molding sand but liberated less dust. He did not keep his nose as close to the little puffs of dust which arose during the operation as had the previous worker. And his dust exposure, determined by holding the sampling tube close to his nose over a quarter hour period exactly as had been done with the previous worker, was found to be not more than the suggested limit, but appreciably less—only eight million particles per cubic foot of air.

Changes in exposure without incurring equipment expenditures and at times with greater efficiency resulting from the necessary job study should not be overlooked as an important control measure.

Finally, it is desirable to check the effectiveness of control measures both after their installation and from time to time as conditions warrant. A well-designed exhaust ventilation system had been installed to remove the solvent used to impregnate a bitumen into the asbestos insulation of a heavy electric cable. This, too, happened to be a product destined for the Navy. Shortly after the exhaust system was installed and probably largely as a result of the exposure prior to its installation, a worker became disabled and was conclusively diagnosed as having an occupational poisoning due to this solvent. The man sufficiently recovered to come back to work but again became disabled just as vapor determinations were disclosing concentrations of some three times that considered to be safe. The check determinations, made by means of both a chemical air analysis method and also a quick optical method employing a portable interferometer, pointed to the reels of finished cable as the source of the excessive amount of solvent vapor in the air. They were separately enclosed and exhausted and the vapor concentration in the room dropped below the injurious limit. Unfortunately the man who had again become ill succumbed to the exposure but all of the some two dozen men whose blood pictures showed definite injurious effects of the solvent slowly improved with the diminished exposure and, while continuing at their jobs, in time showed a normal healthy blood condition. The initial installation of control measures was not effective in this case and only with the check on the atmospheric conditions in accordance with good industrial hygiene practice was the residual hazard disclosed in time to avert even more serious consequences.

As intimated in the foregoing case it is often in order to check not only the conditions but also the men themselves. Thus the exposure of men to lead can be evaluated by periodic analysis of the urine for lead and that to benzol by ratio of inorganic to total sulphate content of urine.

With observations of these five phases of the procedure for prevention of occupational disease through knowing what we have to control, controlling it, and checking on the effectiveness of the control, economic production can be furthered by the utilization of the most economic and the most productive methods without taking an unnecessary toll in human health and life.

Sources of Consultation and Assistance in Occupational Disease Control

WHERE is assistance available for organizing and carrying out the details of such procedure?

Some of the larger industrial concerns have their own industrial hygiene set-up. Most of the industrial states of the country now have bureaus of industrial hygiene or of occupational disease. The staffs and services of these bureaus are available on request. The Division of Industrial Hygiene of the National Institute of Health is working with the government arsenals and navy yards. A number of insurance companies provide a practical scientific service for their industrial policyholders whereby trained personnel together with field and laboratory equipment are available. Not only compensation carriers but also certain group life and group disability carriers extend this service

since environmental conditions affect non-occupational ailments such as respiratory, digestive, and degenerative diseases.

Private consultants are also available as individuals, as universities and as organizations such as the Air Hygiene Foundation of America which has just completed a most interesting annual meeting in Pittsburgh the last two days.

The Council on Industrial Health of the American Medical Association and the Committee on Health in Industry of the National Association of Manufacturers may be called upon for assistance in connection with medical aspects of these problems.

The American Industrial Hygiene Association includes in its roster men who are engaged in the actual conduct of industrial hygiene activities all over the country. Although this is primarily a voluntary organization and has no salaried staff to provide specific services, this Association would direct inquirers to reliable persons and associations for assistance with industrial hygiene programs.

Raising General Health Levels

ALTHOUGH much of the actual conduct of the general health program is within the province of the physician, the nurse, or the public health agency, the value of such a program can well be brought to the attention of the management by the industrial hygienist.

The proper attitude toward physical examination so that the industrial worker or labor as a group will take no exception to it; the stimulation and extension of the activities of the plant nurse, in case there is no plant physician, to include such activities for furthering health as she can appropriately carry out; the education of the plant personnel—all the way from the president to the laborer and office boy — in personal hygiene: consultation with management in connection with all these and other activities tending to raise general health levels can well be approached by the industrial hygienist.

It hurts production just as much to have a man away from work due to non-occupational illness as if due to an occupational disease and, if in addition the utility man is inconsiderate enough to be ill at the same time, the production superintendent has a personal stake in this matter of general health.

We have been talking about disabling illness, but it is not enough to avoid disability; it is probably more disastrous to economic production to have a man half sick and soldiering on the job. He is certainly accident prone in such a condition and not only is a poor producer but may retard those who work with him.

It is a high health level that is to be sought as our immediate and as our long range goal. Anything short of this is an admission of partial failure. In the last decade, we pointed out the profit of healthful working conditions to industry, including both employer and employee. Today, we have a more fundamental purpose in healthful conditions and good health practices: that of furthering economic production as an essential to continuation of the high living standards of our nation.

From the Viewpoint of:

The Employee

D. A. Moore,
Western Electric Company,
Chicago

SINCE 1913 when the Western Electric Company started to pay sickness disability benefits to employees on a non-contributory basis, the viewpoint of the employee in regard to any and all phases of our industrial health program has been of much importance and of great interest to our management.

Abruptly and logically a question arises at this point of how an employer finds out what his employees are thinking about either in the matter of industrial health or any other matter which has to do with employee-employer relations.

Having tried many methods, the best answer to that question from our point of view is to talk with the employees and have the employees talk about the subject — which off-hand sounds rather elementary but in practice implies long years of good employee-relations if you are to obtain confidential and accurate opinions. Therefore, our general conclusions about the employee's reaction to industrial health work are based on our experience in talking with employees on this subject for many years. In general and with the usual understandable exceptions, we classify these employee reactions as follows:

First—The average healthy employee has either given the subject of "Health" no thought, little thought, or because of his good health is not very much interested.

Second—The average healthy employee when he does have to think of his health does not think of it in terms of "industrial health" but solely as a personal problem and one of his individual responsibilities which he expects to work out for himself.

Third—The employee with considerable personal sickness experience is genuinely more receptive to any interest or help offered him by his employer to correct, guard against, or prevent illness, than the *healthy employee* previously referred to.

Now these conclusions may sound like the A, B, C's, but from our point of view I can assure you that they are based on actual conversations with employees at our Hawthorn plant over a period of many years.

Before proceeding with employee reactions, I will again digress for a few minutes to explain that, from our company's point of view, the problem of occupational disease which is sometimes confused as the entire problem of "industrial

health," represents only a minor phase of industrial health work at our Hawthorne plant. We have found that the losses, both tangible and intangible from occupational disease due to the hazards of certain occupations, are negligible when compared to non-occupational common illnesses. This does not mean that we underestimate the value of the engineers, the medical profession, the industrial hygienists, and management in their efforts to make working conditions safer and more comfortable for employees. In fact, this work has been done on a large scale by our company and we are continuing to do it. However, this activity as well as other industrial health work is not prompted solely by the consideration of legal technicalities or liability, because we believe it is really "good" employee relations and sound business to approach occupational disease as well as common illnesses with a decent and human offer to help employees avoid absenteeism which produces vital losses both to themselves and their employers.

As admitted, I am now far afield from the subject of the employees' viewpoint regarding industrial health work, but with your further indulgence I am purposely going to delimit the area of this discussion which also necessitates some preliminary background.

TWO years ago at our Hawthorne plant we decided to conduct an experiment to find out whether there is any constructive method of approaching the problem of common illnesses which cause the major part of employee absenteeism. In studying our statistics we found that the plant population averaged 16 years of service per person within an age range of about 40 years, the total exposure representing 169,079 years, 132,541 years of exposure for men and 36,538 years of exposure for women. The men have averaged one sickness case of eight or more days' duration for every 10.7 years of exposure, while the women have averaged one case for every 6.7 years of exposure. Logically this may seem to mean that every employee has a disabling illness every six or 10 years or more than eight days, but we find that this is not the case in the Hawthorne plant population, since 44% of the men and women in this group have never had a disabling illness of eight or more days' duration. On the other hand, 13% of our personnel have had 50% of our benefit sickness cases, while 31% of our plant population have had the remaining 50% of our morbidity. Absenteeism for illness of less than eight days followed about the same pattern with approximately 16% of the plant population responsible for more than 60% of all absences. It is evident from this, that the problem of excessive morbidity is fairly well confined to a relatively small proportion of the entire plant population.

Therefore, based on our experience with the healthy employee, who is usually disinterested, it was not reasonable to expect favorable results in approaching *all* employees in the plant on the subject of "health" although we might expect good reactions if we approached those who had experienced more than their share of poor health.

Following this hypothesis we decided to explore the area of approximately 1600 employees out of 12,000 who were known to be sickness prone and had health problems which might be improved or corrected. Over a period of two years 791 of these employees with the worst experience have been interviewed and examined under our program which works as follows:

1. The employee is called to the benefit plan department where a trained personnel man explains in detail the purpose and nature of the health program and offers him an examination. The employee is assured that all information is confidential and that regardless of the findings of the examination his status with the company will not be affected. If the employee wishes to participate he is scheduled for an examination on the following day, preferably in the morning. The reason the examination is scheduled the following day is that our experience has shown that employees, particularly women employees, are sometimes embarrassed to be called off of a job for a physical examination without an opportunity of cleaning up completely. Incidentally only 15 employees out of 791 have expressed an unwillingness to submit to an examination under this program, but all of the 15 employees subsequently did visit their family physician.

2. The second step in the routine is the examination conducted by a company physician who does nothing but this work. He spends from one to one and one-half hours with each employee giving him a thorough examination which includes, laboratory tests and x-rays if indicated. Upon finishing the examination, our doctor discusses his findings with the employee and if there are indications that the employee is in need of corrective surgery, dentistry or medical attention he is referred to his family doctor or dentist for the necessary treatment. Our physician informs the employee that he is willing to cooperate with the family physician and, in fact, gives the employee a written statement of the laboratory tests as well as other abnormal findings which can be used by the family physician as he sees fit.

(As to the qualifications of our examining physician, he must not only be a good diagnostician but he must also have skill and tact usually associated with a pleasing personality and an understanding of people. This is important because the program is of little value to the employee if he is not stimulated to carry on with his own physician.)

3. A special case record is made up for each employee and kept in a confidential file in the benefit plan department which is not available to his supervisors. A careful record of his initial and subsequent interview is made with a complete report of our physician's examination plus his recommendations. It is from this record that our medical director and statistician obtain their data without identifying any individual.

4. Within a reasonable time after the examination, the interviewer again calls the employee down to the benefit department for a visit. He encourages the employee to give his opinion of the program and to discuss any results he has

noted. If the employee has failed to carry out our physician's recommendation he is encouraged to do so. Every effort is made to stimulate the employee to voluntarily talk about his health problem. During this meeting the interviewer attempts to guide the trend of the conversation, so that he may uncover social or economic factors which may be an influencing condition in the employee's health picture. In some cases these interviews have been carried on over a period of time when necessary.

Before citing a number of individual cases which I believe demonstrate the practical value and application of industrial health work from the viewpoint of the employee, you may be interested in what we think the result of this program has been to date.

You will, of course, realize that I cannot speak with authority as to permanent achievement. However, we have noted a definite decrease in the frequency of sickness among the people participating in this program, that is greater than could be expected on the basis of chance alone. In comparing their experience to that of a match control group, we find that the sickness experience of the examined people after their participation is definitely better than those in the control group.

After concluding with certain other general statements of employee reactions to our program, I will read a number of typical cases which I believe indicate what the employees who participate in this health program think about it.

IN concluding, it may be interesting to mention that the following additional points have been brought up by employees in our conversations with them:

1. The majority of employees do not like and do not want to go to free clinics, neither do they want free attention from their family doctor. They prefer to pay their way, and because in some cases they have difficulty in financing curative attention when they are ill, they cannot afford to obtain preventive medical attention to build themselves up physically to forestall an illness.

2. Some employees also have told us that they have neglected necessary medical and dental attention because they just cannot afford to foot the bill. This, of course, comes into the field of medical economics. (I do not want to become embroiled in this moot question now facing the medical profession regarding a seemingly growing demand for a prepayment scheme which will provide medical and dental services in essentially the same manner hospital services are now being provided, but I mention it for what it is worth to you.)

3. Most employees seem to appreciate the value of periodic physical examinations and many have indicated that they would like to have us remind them at certain times during the year that they are due to see their physician about an examination.

4. Health pamphlets, posters and ballyhoo will often pass unnoticed by a healthy employee who is eating three square meals a day and following a habitually sane pattern of living. This lack of interest may only be a further sign of his healthy condition mentally and physically.

On the other hand, overstressing health (and in this there is much speculation) may in some cases cause an employee who is not sick to become a plague to the reputable physician and if he has a good income he is often a "sucker" for the opportunist and may finally need and end up in the hands of a psychiatrist. In other words, overemphasis of a health program may cause mental rejection by the truly healthy employee and may only stimulate the potential hypochondriac without reaching the employee who has actual sickness experience and would like some guidance.

Case I: Mrs. X., a bench worker, age 28, with three years of service, had been absent twice on the benefit roll because of anemia. After her examination the company physician recommended medical attention for anemia and a tonsillectomy.

Mrs. X complied with the company doctor's request and reported as follows in a subsequent interview:

"Your doctor thought I should have my tonsils out so I did as soon as I could and were they in bad shape. They didn't look bad on top, but they were all rotten underneath. Since then my eyes don't bother me and I don't have no more headaches, sore throats and colds. My little sister lives with me and she and my husband holler at me because I do so much work around the house now. I say to them, 'You always get a cold and don't feel peppy like I do.' When I feel good I just gotta work. So I let them holler and I do what I think should be done.

"My blood's O.K. now too. The doctor gave me pills for it and I only have to take them once in a while now. I got color in my face now, before I looked like a corpse. My husband likes me to have color in my face that isn't all put on. I feel swell now and I'm going to keep that way."

Case II: Mr. X., a repairman, age 33, with eight years of service had had seven absences on the benefit roll. After his examination the company physician recommended that Mr. X see his physician and secure medical attention. Mr. X cooperated and in a subsequent interview reported as follows:

"I think I'm in a lot better condition now than I was before I had my examination. I had my tonsils and hemorrhoids out at the same time. It was kinda tough being worked on at both ends at the same time but I thought it was better to get it all over with at once.

"I think that examination was of benefit to me and it would be of value to any employee."

Case III: Miss X., age 38, had six benefit absences in 19 years of service. After her examination the company physician recommended that she see her own physician and dentist for treatment. In a subsequent interview she reported as follows:

"I went to my doctor after the company doctor recommended that I secure medical attention. He found me to be in a run down condition and prescribed a tonic. I took two bottles of the medicine and have felt fine ever since. I no longer have the headaches I used to have. My dentist took care of my teeth, there were no abscesses, only cavities to be filled. I am glad I saw the doctor when I did. He helped me a great deal and I am sure I enjoyed my vacation more because I was feeling better. The only people who are happy are those who are busy and you can't keep busy if you aren't feeling well."

Case IV: Mr. X., age 58, had had 10 benefit absences because of respiratory diseases in 20 years of service. After examination by the company physician, Mr. X was referred to his family physician for treatment. In a subsequent interview, Mr. X reported as follows:

"The doctor here told me I ought to have more vitamin A to build me up. I went home and told my wife about it and we figured up our diet, and we felt we weren't getting enough vitamins. I went to my doctor and he told

me the same thing. I told him I felt that I got as many vitamins as anyone else. He explained that some people required more vitamins than others and I was probably that type.

"He put me on a program that included 'A' and all the other vitamins. My wife started taking them too. We both went through the winter without a single cold.

"We started taking them again a few weeks ago. I don't think they can be beat. I believe they kept me from getting the 'flu' during the epidemic last winter.

"I think the physical examination and the advice got was of a lot of value to me. It kept me well and made a vitamin enthusiast out of me."

CASE V: MR. X., a bench worker, age 35, with three years' service, was examined November 2, 1938. Prior to his examination, MR. X had had two absences on the benefit roll for a total of 122 days.

As a result of the examination, the company doctor recommended that he continue on an ulcer diet and also discussed other forms of treatment with MR. X in case his condition did not respond to treatment. It was also recommended that he consult an oculist and his dentist.

MR. X's condition did not respond to diet. On January 23, 1904, he entered Hines Hospital for an operation to correct his ulcer condition. The operation was successful.

In an interview following his return to work, MR. X stated: "I think that my condition was caused by improper diet while we were on relief during the first depression. I certainly appreciate the help and interest the company has shown in my health problem. I can eat anything now and I feel good all the time. It means a lot to be able to enjoy life."

CASE VII: MRS. X., a bench worker, age 24, has four years' of service. She had a history of one benefit absence and five short absences during a single year.

As the result of her examination, the company doctor referred her to her family physician because of anemia and underweight. MRS. X placed herself under the care of her physician and is making satisfactory progress.

In an interview, MRS. X stated: "During the depression, both me and my husband were out of work. We used up all of our savings and after that we some times did not have enough to eat and, of course, we had no money for the dentist or doctor. I think my condition is due to that experience. My husband's teeth are so bad he has to have them all out just because we were forced to neglect them. This has been a valuable experience to us. We are going to plan our budget hereafter so we will be sure to have enough laid by for medical and dental attention."

CASE VIII: MRS. X., a cotton winder, age 41 with 23 years service, had eight absences on the benefit roll.

She was examined November 10, 1938. The company doctor advised her to consult her family physician with regard to cold therapy and a diet. He also referred her to her dentist. In a subsequent interview, MRS. X said:

"I went to my doctor right after my examination. He gave me injections to prevent colds and also put me on a diet. I also went to my dentist. The x-rays that the company had taken of my teeth were of great help to him. I certainly appreciate that they took them and if there is any expense I would like to pay it. I greatly appreciate the fact that the examination was suggested to me because it has done wonders for my health. If the examination and the money I spent for my own doctor would have cost me $..... I would have felt that it was money well spent. I am so pleased with my results that I have told some of my friends on the outside to take care of themselves the same way I have. Several have followed my advice and are grateful to me for suggesting it. I have had very good luck with my cold shots. I haven't had a cold since I began taking them."

CASE IX: MR. X., an output tracer, age 44 with 25 years of service, had eight absences on the benefit roll. He was examined December 30, 1938, and referred to his dentist for dental work and to his doctor for cold prophylaxis. In a subsequent interview, MR. X said:

"I visited my doctor and he has put me on cod-liver oil to build up my resistance to colds. So far I think it has been effective in many cases since I began taking it. I have not had a single cold. I think the kind of examination I had was very beneficial to me. It is a good idea to have a check-up periodically. I lost a brother years ago, and I know if he had had this opportunity at the time he had worked with the company, the condition causing his death would have been prevented. You can count me in on a 100% on any examinations in the future. I think they are a fine thing."

CASE No. X: MR. X. a quality standards engineer, age 49 with 14 years of service has had six absences on the benefit roll.

MR. X. was examined November 25, 1938. He was referred to his doctor for cold prophylaxis. In a subsequent interview, he said:

"You know a stitch in time saves nine. On my examination the doctor told me that vitamin A might help my sinus trouble. I went to my doctor and he prescribed it and it really worked. I am planning on starting it again soon. I think this is a very good service that the company offers and I appreciate their interest in my health. Any time you want me for an examination or to talk to me about my health, feel free to call me down."

CASE No. XI: MISS X. a bench worker, age 33 with 13 years of service had five absences on the benefit roll. She was examined December 13, 1938, and the company physician referred her to her family doctor for anemia and vitamin therapy. In a subsequent interview, MISS X. said:

"I am glad to come down for an examination any time that you want me to come. My physical condition has improved. I don't have the dizzy spells I used to and I think it is because of the tonsillectomy I had. I did get a lot of benefit from that examination, and I appreciate being told what is wrong with me. It seemed that every time I was called for an interview, I was feeling especially bad either because of my arms or a dizzy, 'dopey' feeling in my head. I was so worried about myself because I was afraid I was losing my mind and it took all the will-power I could find to finally shake myself free from those crazy ideas. Every time I was in one of these moods, I was called to the service department, and I can't explain how much better I felt after being interviewed. I feel good now with the exception of a backache and a tired feeling."

CASE No. XII: MR. X. a jig borer operator, age 43 with 18 years of service, had five absences on the benefit roll.

He was examined by the company doctor on December 19, 1938. He was referred to his dentist for dental work and advised about his weight, a strict diet and exercise. In a subsequent interview, MR. X. said:

"I haven't seen my dentist yet but I am going to go right after the holidays. I think my examination was very thorough and was beneficial to me. It is a good thing to know what is wrong with you. It saved me money by having my teeth x-rayed by the company. It would have cost me about $10.00 to go some place else to have it done. I guess I am like everybody else, I have to have somebody get after me before I'll go and see a doctor or a dentist. I think this idea of having an examination is a good one."

CASE No. XIII: MR. X. a group chief, age 52 years with 31 years of service, had nine absences on the benefit roll.

At the time of his examination by the company doctor, he was found to be respiratory prone. He was referred to his doctor for cold prophylaxis and gastro-intestinal disorder. In a subsequent interview, MR. X. said:

"I think this service is very valuable to a person. Of course, I have a physical examination every year anyway. I have talked to other employees who had this examination and they feel the same way. An examination like the one I had may uncover something that a person may not know about. I believe in early medical attention myself. I think a person saves money by seeing his doctor for an examination when he is well."

CASE XIV: MR. X. a process inspector, age 42 with 24 years of service, had seven absences on the benefit roll.

He was examined December 9, 1938 and referred to his dentist. In a subsequent interview, Mr. X. said:

"I am in pretty good shape now. The only thing they found wrong with me before was my teeth. I have had them attended to. They had a 'h--- of a time' taking one of those teeth out. It was infected and it's a good thing I had this work done. I think this idea of examination is O.K. It don't hurt anybody to see a doctor once in a while and get a checkup."

Case XV: Mr. X., a manufacturing analyst, age 43 years, with 25 years of service, has eight absences on the benefit roll.

Mr. X was examined November 30, 1938. The company doctor referred him to his dentist and his family physician for cold prophylaxis and gall-bladder trouble.

In an interview following the examination, Mr. X. said: "I feel better than I have in a long time. I gained 20 pounds since last winter. I have decided it was because I quit smoking. I had to quit when I was sick with a cold so I just didn't start again. I used to smoke a package and a half a day and had a cough all the time. My wife was afraid I had the 'con'. Since I quit smoking the cough has left me and I eat a lot more. I'm glad I had the examination. If I hadn't gone to see my doctor, I would have had the 'flu' during the epidemic last winter. All the fellows that worked with me were coming down with it. I was afraid I would catch it too. I didn't even have a cold. My doctor told me he thought the examination had been very valuable. He said that if I had gone to a hospital for that examination, it would have cost me $25.00 or more. I want to thank you and the company for the interest you have shown in helping me keep my health. Any time you want to examine me or talk to me, don't hesitate to call me down here. I'm the kind of guy who appreciates what is done for me."

Case XVI: Mr. X, a milling machine operator, 45 years of age, with 24 years of service, had eight absences on the benefit roll.

He was examined December 7, 1938, by the company physician who referred him to his dentist and requested that he consult his family physician for treatment for varicose veins and for cold prophylaxis. In a subsequent interview, Mr. X said:

"I think the idea of giving an employee a physical examination is very fine. I like the idea of a blood test. It is a break for all of us as well as a help to those who might have a social disease. I was very well satisfied with the doctor. He was very kind, very careful and thorough. I think he was superior to a doctor I had examine me about five years ago. I have visited my doctor and he is giving me cod-liver oil. I've gotten the whole family taking it now and I think it has already improved our health. They don't have the colds they used to have.

"I think a thorough examination is always valuable to a person. Take my case for instance. My dentist said my teeth were all right. I took the x-rays that the company hospital had taken to him and he said that they were still all right but one looked suspicious. I had some trouble with my back and my doctor blamed my teeth so the dentist took out the ones he said were suspicious. He found pus pockets on all of them. My back doesn't bother me any more."

Case XVII: Mr. X, age 57, an inspector with 27 years of service had 14 absences on the benefit roll.

He was examined October 31, 1938, and was found to be in good physical condition, considering his age. During an interview following his examination, he said:

"My health is good. I have not been sick since I was examined and at my age I can still beat my kids in playing baseball. I can do as good a day's work on the conveyor as some of the younger fellows. I can keep up with any of them and beat a lot.

"I think a regular physical examination is worth a lot to a person. It doesn't seem necessary to do it every year but it should be done once in a while."

Case XVIII: Mr. X, a lathe operator, age 45, with 24 years of service, had seven absences on the benefit roll. He was examined by the company doctor on November 8, 1938, and was referred to his family physician for treatment for arthritis. In a subsequent interview, Mr. X said:

"I think this type of examination is of great benefit to the employee but there might be a possibility that some of them might misunderstand the reason for giving it since they might be suspicious of the company's intention. The examination in my case has been of help although I have been ill a couple of times since I have been examined. The first one was due to an accident when I stepped on a nail during my vacation. The next one was due to a kidney stone. When I was younger I had trouble with bronchitis. A doctor told me I would have to leave the job and get out doors. I made up my mind to quit the company and go up into Michigan or Wisconsin. I told my boss that I was going to quit and explained the reason why. He asked me to hold off for a little while until he could look into my situation. As a result the medical department examined me and put me on sick leave. I took my family and went up into upper Wisconsin and rented a summer cabin and lived out in the open for three months. When I returned to the company, the doctors were amazed at the improvement. They accepted me for work and I have not been bothered with bronchitis since. I don't know of any other company that would have done this for an employee. I never will forget the attitude of the company towards me at this time. It is things like these that employees remember and it is these things that make them well."

Case XIX: Mr. X, a cable former, age 44, with 19 years of service, had 11 absences on the benefit roll.

He was examined by our company doctor on November 2, 1938. The examination revealed that Mr. X had a chronic bronchitic chest, a kidney condition, and a nervour condition. He was referred to his doctor for treatment.

In a subsequent interview, Mr. X. said: "I think that a regular physical examination at frequent intervals would be very beneficial to employees; however, I feel that after the examination has been made and the doctor's recommendation has been carried out, the employee should be left alone. The examination I had was very beneficial to me. For years I had a misplaced kidney and I did not know what was causing my trouble. After my examination, I went to my doctor and received treatment and instruction as to how to take care of myself. This not only relieved my physical trouble but also relieved my mind for I had worried a great deal about my poor health.

"There might be some misunderstanding among employees as to why they should be examined regularly. Employees are inclined to ask questions of other employees who are called down to the hospital or service department, and they are naturally suspicious of the motive of the company in giving certain employees these examinations. However, after the program is in progress long enough to demonstrate that it is for the employee's benefit, I don't think there should be any question."

Case XX: Mrs. X, an inspector, age 39 years, with 19 years of service had seven absences on the benefit roll.

She was interviewed November 11, 1938, and at that time she refused the examination on the basis that she was under the care of her doctor. Later she was called in for another interview. At this time she said: "I don't want no physical examination by the company. I won't take one unless I'm ordered to do it. If I have to have an examination, I want to go to my own doctor. I don't see why I have to take an examination, I know what's wrong with me. My doctor told me a long time ago, but I ain't sure he knew what he was talking about. I feel that the less the company knows about a person, the better off that person is."

Mrs. X then asked, "Say what's this examination all about. If it's to examine your blood for syphilis I think that would be all right but I don't want no other kind of examination. I've had to make my way all my life. My mother and father were from the old country and when they came over they didn't give up their old country ideas. All the kids were put to work as soon

as they were able and all they earned was turned over to our folks. I went to work when I was 13 or 14. I know my folks meant well but they were hard on us. We had little time to play and never had any money to spend for shows or pleasures like other children. I don't have any kids and I don't want to have any. My husband feels the same way about it. We don't want to bring anyone else into the world to suffer as we have had to suffer.

"Say, if I gotta have an examination, I would like to have my own doctor do it. You give me a note to him with the things I have been absent for and I will go see him."

CASE XXI: MRS. X, a bench worker, age 31 years, with 16 years of service had been absent on the benefit roll seven times.

She was examined on May 4, 1938. At that time the doctor suspected her of having cancer of the breast and referred her to a specialist. The diagnosis was affirmed and MRS. X went to the hospital for an operation.

In a subsequent interview, MRS. X said: "I appreciate very much the examination that the company gave me. If I hadn't had it I probably wouldn't know my condition until it was too late to cure it. My doctor tells me that my condition is arrested and will probably be cured. It is all because I got it soon enough. I want to tell you again that everybody here has been wonderful to me, especially last summer. I can't thank them enough. It's good to know that the company is so interested in its employees."

CASE NO. XXII: MR. X. a tool worker, age 42 years, with 22 years of service had nine absences on the benefit roll.

He was examined November 16, 1938. As a result of the examination he was requested to see his dentist about sinus trouble and also to see his doctor, after the blood count was taken, for a hypotension, hernia and prostatic examination.

At the time of the examination, MR. X. stated: "I think that a regular physical examination is all right but what if they find something wrong with me and what if the treatment is very expensive? If it's only $10.00 or $15.00 a man can stand it but if it runs around $100.00, he might hesitate a long time before he will be able to manage."

From the Viewpoint of:

The Insurance Company

AMBROSE KELLY,
American Mutual Alliance
Chicago, Illinois

I HAVE been greatly interested, as all of us have been, in listening to the discussion which has taken place so far this morning. I think that one important point in my discussion must be made clear at the very beginning. The insurance company has a relatively circumscribed place in the industrial health field. I think that is a result of the very circumstances under which it enters the picture in the first place.

As all of you know, the insurance company takes its place for the most part by either insuring the liability of the employer to pay workmen's compensation to his employees; or through the issuance of a group health or group life insurance policy on the employees in the establishment.

We have occasionally found — fortunately, it is, I think, a phenomenon somewhat less prevalent now than it has been in the past, some resentment on the part of both management and employee against what they regard as unwanted interference by an insurance company in what they believe is essentially a private problem of their own.

I think that all of you can immediately see that the insurance company is very directly concerned with the whole industrial health procedure as the compensation carrier. It is, of course, that field in which I have the greatest experience and, therefore, the field about which I will talk.

The compensation carrier must pay whatever benefits are granted to an injured or a disabled employee because of disease. At the same time, that carrier has a very definite interest in returning the employee who has been injured or disabled to his job with a minimum of permanent disability in the shortest possible time.

The dollar sign is, perhaps, the most immediate and direct interest in this whole problem, but I want to assure you — and I am sure that those of you who are on the side of management and some of you on the side of labor will realize — that the insurance company feels that it has an interest in preventing losses which inevitably fall on both the employer and the employee in the event that an accident takes place.

The compensation insurance policy from the very nature of things can only pay part of the loss. I think everyone on the side of management knows that there are heavier losses uncompensated in every case in which an employee is injured or disabled on the job.

I think it was Dr. Newquist, of the American College of Surgeons, who in a study of the whole problem of industrial health, said that the disability or the lost time from accident and disease outside of the plant overshadowed the truly industrial disability or truly industrial lost time by 15 to one. I think that all of us from our own experience have come to the same conclusion. I have heard the same comment expressed here time and again this morning.

Nevertheless, the insurance company is most effective. As a matter of fact, I think 90% of its work must, of necessity, be confined to the comparatively small field of industrial accident and occupational disease.

One of the most interesting sidelights of your discussion this morning is that I have hardly heard the term "industrial accident" used at all. Apparently most of the men working in this field feel that that is a problem which, if we have not controlled it, has been sufficiently studied so that the control methods are available to use. Of course, it is in that field that the insurance company plays its greatest part.

All of you, however, realize that the work which has been done in reducing industrial accidents is far short of the results which can be accomplished. If you take the industry studies made by the National Safety Council, which contrast the experience of the best plants in each industrial group with the average experience or with the experience of the worst plants, you will immediately realize that if we could have as good work in all plants as we now have in the best ones, we could probably cut the present very heavy toll from industrial accidents in two.

The field of occupational disease, so well discussed by Mr. Cook in his remarks on the work of the industrial hygienist, is one that has come over the horizon in recent years; and, I think, four or five years ago was occupying our attention almost to the exclusion of the fields which have been discussed this morning and the industrial accident field which we previously studied.

Now there seems to be a general feeling that, as is the case with the industrial accidents, the necessary controls of occupational disease are in our hands, and it is only a case of applying in the individual instance what we already know if we are to reduce those occupational diseases.

I look forward to the day when the case of industrial silicosis will be such a novelty that a first-class case of silicosis will be an exhibit. You will call in men who haven't seen a case of silicosis before to see what this industrial disease that was so important in the nineteen thirties really looks like.

I think the other newer occupational diseases, such as benzol poisoning; the industrial poisoning to which we are exposed from the use of other solvents; cases of dermatitis, all of these new occupational diseases as they come over the horizon for the first time are the subject for intelligent study which in almost every case results in finding either a substitute non-toxic product or controlled procedures which, if followed, will protect the health of the employee.

I am very proud to say for the insurance companies that they have tried to the best of their ability to assist the research organizations which are studying such new sources of occupational disease. They have tried through their engineering departments across the country to see that the control methods once learned and established are brought out to the men in the field who would otherwise have little opportunity to use them.

Let us take the specific case of the insurance company. A compensation policy is issued to a foundry, for example. It is a small foundry, so small that it is not in a position to employ a full-time safety engineer. It has no medical department of its own. It lacks most of the facilities which have been discussed by representatives of management here this morning.

That industrial risk of necessity looks to the insurance company's engineer for a survey of the hazards which exist in the risk; and the insurance engineer is more than happy to have the cooperation of the management in making such a survey. Then, of course, the engineer makes his recommendations to the management.

Now, it would seem that in almost every case such recommendations would be greeted by management, and it would be anxious as quickly as possible to put them into effect. But, practically, and unfortunately, that is not always the case. The plant superintendent or the president of the company feels that the engineer is creating a boogeyman out of thin air; that the plant has been operating in that particular way for 15 or 20 years and they have never had a case of disability arising from the danger which the engineer's report points out. So, often we find that it is very difficult to secure the cooperation of management in carrying out the recommendations which are made as the result of an engineering survey.

Then, and I think even more important, are the difficulties which often arise in working with employees who are also inclined to disregard the safe working practices which have been set up for their own protection. All of you are familiar with the difficulty which we have had in the past in getting men to wear goggles on jobs where the engineer knew there was a danger of eye injury.

We have trouble in keeping employees from taking guards off moving machinery. If the machinery is broken or stops, so often an employee will remove a guard to remove a piece of waste or to make a minor repair, and incur the risk of very serious injury.

I am sure that all of us, and I speak now as an insurance man interested in other than industrial fields, recognize the same frame of mind because so often we will disregard what we know are safe driving rules in an effort to save ourselves three minutes or, perhaps, be on time for a meeting such as this. An employee, being human, is not different from you when you go over the speed limit or cut in and out of traffic because for the moment it seems to be convenient to do so. Thus he will try to save time by removing the guard or doing something else which he knows exposes him to the risk of injury.

A POINT has been stressed this morning in which we are indirectly but very definitely interested, and that is the necessity for a general industrial health program: the interest of management in maintaining the productive efficiency of the workers for the sake of management and maintaining those men in good health for their own sake so that, as members of the community and as the earning factor in their families, from the standpoint of their own personal happiness, since the sick man is seldom happy, they will receive the benefit from such a program.

We, with our primary interest in the field of industrial accident and occupational disease, can see and stress the effect of such a program upon the field in which we are interested because, as has been brought out in survey after survey, and has been mentioned again and again this morning, the sick man is much more prone to accident than the man who is well. The man who has mental worries; who has a very disturbed domestic situation at home — he may have a sick child and be unable to pay his doctor bills; he may be having trouble with his wife — whatever the case, if there is anything in his home environment which tends to make him absent-minded at his job, in so far as it reduces concentration upon the particular task that is before him, it exposes him to the danger of accident.

Then, too, we find that the home environment in some cases is directly involved in the occupational disease from which the employee may suffer. I think the most pertinent case of that, of course, is industrial tuberculosis; particularly

where such tuberculosis is also involved with a silica exposure. As you all know, under the occupational compensation laws of most states, the case of silicosis complicated by tuberculosis is an industrial case and is compensated, as it should be.

But, we feel, and I think the evidence is on our side, that in nearly every case where tuberculosis comes into the picture — that is too strong a statement — in many cases, where tuberculosis comes into the picture, the tubercular exposure arose from the home environment. If that man could have been kept from that home exposure, he probably would have continued as an active and very successful unit in the plant in which he worked for the remainder of his useful lifetime.

One last point before I conclude. I am trying to save a few of these minutes for you. The value of the insurance company's work is, of necessity, most appreciated by the small employer. In the case of a very large plant, it has its own safety engineer and it may have two or three men on its staff. They can undertake the task of inspecting the hazards which exist in the particular plant. They can see that all machinery is properly guarded. They can, themselves, make the tests of the atmospheric exposures, if there is a toxic substance used. You have a medical department which is on its toes through pre-employment and periodic examinations to see that the employees maintain a high general level of health; and that any accident or disease case arising out of the employment secures prompt and efficient treatment.

But, the small employer has none of those things. He may have 15 or 20 men, may have 50 or 100 men, nevertheless his budget will not permit him to have as a regular part of his own staff, even a part time engineer or a doctor on a part time basis. It is in that field that the insurance company, I think, does its greatest work in trying to make available to that small employer the same type of service — in perhaps more limited ways, since the man is not on the job every day. But it tries to make available to him — through a preliminary survey of hazards, analysis of accidents, and providing expert medical care for those injured — somewhat the same service the large employers make available to their own employees, themselves.

The insurance companies are extremely grateful for the cooperation they have always received from the larger plants which they insure. Every insurance company engineering department will tell you that the problems of handling a compensation risk are much smaller where you have such an establishment. But, I think that from the standpoint of a job we do for the general public, the best place for the insurance company to prove its worth is in the small plant. I think I can assure you, in conclusion, that the insurance companies have a very direct interest in the whole field of industrial health. If there is any way in which they can cooperate with management and with the employees, with the industrial physician and with the industrial hygienist in making progress towards the goal which we all hold before us, they will be very willing to do so.

From the Viewpoint of:

The Legal Profession

FRANK R. PEREGRINE,
Peregrine & Bruegger,
Chicago

FROM the viewpoint of the legal profession, the practical value and application of industrial health work relate largely to the handling and the trial of industrial disease claims. I feel that our portion of this program is rather a thin slice and that perhaps it ought not to be presented at all, because some aspects of our part of the discussion deal with ill will, and claims and disputes as between employers and their employees, and thoughts of that kind ought not be stressed in connection with industrial health work. But, I shall to the best of my ability present to you some of the ideas that have occurred to me in connection with the subject assigned.

In one sense, it is the by-products of industrial health work that are useful to the legal profession in connection with claims.

The main or primary purpose of industrial health work, is, of course, the preservation of health; the lengthening of years of life; the discovery and remedying of health hazards; and it is a great humanitarian work.

If properly conducted, however, it leaves behind it a trail of discovered facts and of evidence of those facts which is exceedingly useful to both the attorney representing the claimant and to the employer in determining whether or not a claim has merit, and the presentation of evidence at the trial in the event it is contested.

When a claim arises, whether or not it has merit is to be determined by the ascertainment of facts. That is invariably true. If a trial of the issue is had, the outcome depends, or at least is supposed to depend, upon the legally competent evidence on the issues of fact involved. A lawyer—whether he be for the claimant or for the employer—who is without legally competent proof of the facts determinative of the merit of the claim, is like a brave man with an empty pistol.

The ideas that I desire to convey to you respecting the correlation of industrial health work with the handling of claims and the trial of suits or claims before commissions and courts, can, I think, best be conveyed by giving you a recitation of some of the actual situations that have come up in my practice without, of course, giving names, but with just enough details so that if you think with me and have in mind what industrial health work is, they will bring to you an understanding, better than I could convey with generalities, of just where industrial health work fits into the picture of claims.

Not so long ago, a very excited gentleman came into my office and said, "We want to employ you to go downstate and try a case of alleged silicosis. Now, it is very highly important that we defeat the claim. We can't afford to have any precedent here of any of our employees proving that he has

become disabled by silicosis because it will precipitate a veritable deluge of claims."

It took me quite a while to get him off the subject of what bad precedent it would be if this workman won his case. I asked him to get down to facts. He spoke of x-ray examinations and spoke generally of "infiltrations" without characterizing them. I finally prevailed upon him to bring up the x-ray films of the case and to go to the office of an outstanding roentgenologist in Chicago, who is better qualified on silicosis, perhaps, than anyone I know here, to see what he thought of the films.

He came back to my office and said, "He says the man has far advanced silicosis; that it is a typical text book case." I said, "Settle it or get someone else to try it."

There you have an example of a complete absence of anything resembling an industrial health program. That employer didn't know anything about what was happening to his men, and when a claim arose, the employer's first reaction was that, regardless of the facts, the claim must be defeated.

I had another case in which I was approached in the same mood; the main object was to defeat the claim, to avoid bad precedent, to show other employees that they could not make claims against the company and collect. That, too, was a silicosis claim.

After I succeeded in getting them to talk about their contention as to the facts I found that their contention was that there was no silicosis hazard in the claimant's occupation with them, so that, whatever the film showed, it couldn't be silicosis. I finally got around to the point where that particular employer took x-ray films of all the other men similarly situated, and the result was that no less than a half a dozen of these men were found to have the effects of dust in their lungs. Two or three other cases of silicosis were discovered.

Not long ago, I had in my practice a case of alleged carbon disulphide poisoning. That claimant in his work was around certain devices and machinery where carbon disulphide gas was undeniably generated. That some of the carbon disulphide gas found its way into the breathing zone could not be denied. Medical authorities stated thresholds of safety below which it could not be harmful based on researches in the past, and above which it might be. That claimant recited from the witness stand an almost too perfect text book picture of symptoms and complaints of carbon disulphide poisoning. He produced a physician who gave an almost too perfect text book picture of the symptoms and findings of carbon disulphide poisoning; one that might lead the uncharitable to suspect that his record of findings was made with a text book in his hand rather than with the patient before him.

In that case, although the employer had given considerable attention to industrial health work, I was without any results of adequate tests of the air in the breathing zone of that workman. Some tests had been made but not where he worked. Their value was only relative. Expert testimony was produced and was, of course, effective. But, in that particular case, the day was saved by moving pictures which the lawyer had caused to be taken and not because the employer's health program had been what it should have been. That employer should have made more and different tests of the air than were made, not primarily for the purpose of defeating claims, but, primarily, for the purpose of determining and not guessing as to the hazards in which the employees were placed.

I had a sulphur dioxide case for a large corporation which had an industrial health program of considerable magnitude. It had men working where the materials were impregnated with sulphur and where they were constantly working over the containers containing the sulphur solution. That man had active pulmonary tuberculosis, and he later died with it. The controversy raged around whether or not, in his breathing zone, there was a sufficient percentage or proportion of sulphur dioxide to have caused the trouble with his lungs. There, again, I found that that particular concern had never made any air tests in the work place of this individual claimant nor had it ever made any air test of any kind in the entire building, which was a nine-story building and which had more or less sulphur dioxide in the air everywhere in the building. That employer had been content with certain tests in another like building in another city.

I had a case in which it was claimed that inhalations of chlorine gas had caused a heart condition. The chlorine was there and used in the process. At times, some of it would escape and a pre-employment examination, a year before, had discovered nothing wrong with the man's heart. He had a bad heart at the time he made the claim. There is an instance in which the pre-employment examination militated in favor of the employee. Without going into the other elements of the case to any great extent, the case was settled.

Very often, it has been my experience, that where an industrial health program has been properly and impartially carried out, the results thereof, the information that is of record, is the difference between the claim being contested and being accepted or compromised. It has been my experience that industrial health work, as it relates to claims, as often benefits the claimants as it does the employers. It does provide facts. If properly carried out, it enables the attorney to know what the facts are that govern the validity or the merit of the claim.

Now, these examples that I have given are just illustrative. They deal with dust and with poisonous gases, but claims of industrial disease are by no means confined within that area. The circumstances that give rise to and surround claims of industrial disease are infinite in their variety. Few industries, indeed, can regard themselves as immune from the making of such claims.

My message to you is that when and where such claims arise, a proper health program, carried on by the industry during the years preceding the arising of the claim, will almost invariably provide the guide for the determination of the merit or demerit of the claim; and will provide the legally competent evidence that is necessary in the trial of the claim if it is contested.

Now, the legal profession is also interested and concerned, perhaps, a bit indirectly — not so directly as with the handling of claims — with legislation on the subject of industrial health hazards and occupational disease. Such legislation can be drastic or reasonable, often depending upon the magnitude of the evil as it is conceived by or represented to the Legislature; and often depending upon the degree of callousness that industry has manifested in the situation. Such legislation can be good or bad, according to the degree of understanding of the subject matter. Industrial health work discovers facts. It explodes fallacies. It evaluates hazards scientifically and accurately. It determines what results those hazards are producing under actual operating conditions. It supplants theories and hunches with knowledge and with understanding, and above all it preserves health and lengthens the lives of human beings. It is the one best prophylactic measure against drastic and unreasonable legislation and against exploitation by claims. It pays for itself, I am satisfied, in dollars and cents.

But, because lawyers are first men, and then lawyers, because they are human beings before they are lawyers, I am not digressing from my share of this discussion, from my assigned topic, when I say that the fact that industrial health work pays for itself in dollars and cents (of which there can be no doubt) is by no means the main reason why it should be fostered, amplified, and carried on by industry. Happy can be and should be the industrialist who, in the declining years of his life, when reflections come, and when the words of that old hymn recur more and more: "Just a few more years in this vale of tears, and the story will be ended," can conclude his reflections upon the achievements of his life in the field of industry with the thought, "And this I have done; this I have accomplished; this I have achieved without harming the health or shortening the life of any fellow man who helped me do it."

From the Viewpoint of:

Labor

MATTHEW WOLL,
Third Vice-President,
American Federation of Labor,
New York City

WHEN I was graciously invited to speak to this gathering, I was happy to accept without a moment's hesitation. My one regret was than another engagement, an obligation that was not to be laid aside, makes it impossible to say to you in person some of the things that seem of major importance, as viewed from the standpoint of labor.

I am told that this is the *first* American Conference on Industrial Health, but that it is hoped that others will follow annually or at least periodically. With so many conferences being held on every conceivable aspect and shade of so many subjects that are of so little real human importance when compared with this one of health in industry, does it not seem a little strange that this is so? Of course there have been many, many meetings at which health of the worker has been discussed. In fact, a very considerable progress has been made, partly as the result of those meetings over the past two decades, and especially the past decade. Witness the passage of many new health laws and modifications, broadenings and clarification of others, all aimed at improving health or safeguarding it, or improving conditions affecting the health of the working population. These new laws and changes in old laws may not all have proved by experience to have been the very soul of goodness that they were expected to be. One can say that also about a great many laws that have been passed in many fields. But they were efforts, and they bore fruit and, profiting from experience, further efforts will produce better fruit.

In approaching the subject and purpose of this meeting, I questioned myself along these lines: *Why* should there be a national conference on industrial health? Are there factions which hold diverse opinions as to the need, or the desirability, or the economy or the profit to be gained, or the human misery to be averted?

I would be greatly surprised if there is a person in this room who is not keenly interested in, and strongly in favor of, efforts to improve the health of industrial workers. I believe that such an interest is felt by capital as well as labor, by employer as well as employed. I believe that it also includes those who come in contact with both of those main branches of our democratic industrial system, such as the industrial physicians, safety engineers, nurses, and all those whose duty is to protect or to restore health, and also those connected with institutions devoted to the care and restoration of those whose health has been impaired. Your presence proves that interest.

Let us grant that our aims are identical and that they spring from similar motives, even though some of these motives may be selfish—they are "good business" motives. There are innumerable parts and phases to the problem of industrial health. Some of these, which are more or less controversial matters, are being discussed at this conference. About many of them, I know nothing, or too little to speak, but there are phases of the subject that, to me, and to that large fraction or division of our population broadly called "labor" seem to possess a degree of importance that warrants not only most complete discussion but prompt and energetic action.

The small segment of the problem that I propose

to discuss is that relating to chest diseases and their bearing on our national health problem, on our national economy (measured in billions as all matters of expense must be, nowadays) and our national man power, whether engaged in production or in military defense. In the coming years, the overalls uniform of the workman will be as honored as the khaki of the soldier.

To infer that these problems are new or novel, of recent development or recognition would be misleading. If there is anything that is new or even recent, in relation to them, it may be the awakening realization on the part of more people to their great importance. The importance was always there, but only a few of us realized it.

For example, how many of our people know even now, after much publicity has been given to the fact, that tuberculosis alone has cost our Federal treasury about one billion dollars for compensation to world war veterans? Or that the total, already enormous, is still increasing at the rate of over 40 millions a year, 22 years after the war? These figures do *not* include hospitalization costs or the cost of building a chain of great sanitoria by the Veterans Administration, from one end of the country to the other, nor do they include the maintenance of a number of beds sufficient to hold the equivalent of two and a quarter Army divisions. This has gone on year after year for over 20 years, and still no end is in sight, and all this for tuberculosis, a *preventable* disease.

Who, outside of the circle of workers in the field of industrial health, realizes that the ills that man is heir to account for 10 to 15 times as much loss of time to workers in industry as do industrial hazards and accidents, combined? Labor, capital, and government have cooperated effectively to reduce industrial accidents to a degree justifying mutual praise, self congratulations and back slapping, but we have but whittled down a sapling. Here is a tree 10 to 15 times as big, that still stands square in the middle of the path toward health. We have been going around it, taking a little chip off occasionally, but *now* is the time to tackle the real health problem, *now* when there is a double-barrelled reason for doing so; when we face an emergency in which man power is of the utmost importance, may even be the basic factor in final victory.

Preparedness is the price of Peace.

Production is the foundation of preparedness.

Workingmen's health is an essential to production.

Therefore, health is the price of Peace.

IN A country such as ours, having resources ample for every conceivable requirement, the basic factor in success of any great National undertaking, such as our defense program, is *man power*. Man power produces the food, works the mines, operates the plants, builds the machines and weapons of war, furnishes the intelligence and the direction needed to coordinate all of these component parts. We have recently witnessed an appalling example of the irresistability of perfectly organized, coordinated, and directed *man power*, a perfect Juggernaut.

To be prepared to resist that type of aggressor means not only more and better machines, but above all, more and better men. To bring this about is the business of all concerned, not merely of a select few or of a certain group, however large. Labor, meaning that section of our citizenry which works in our factories and mines for stipulated wages, constitutes the producing element, which coupled with the farmer, supplies every commodity entering into commerce or the munitions of defense. Every item in the needs of our country in peace or in crisis is the product of the farm, the mine and the factory.

A considerable part of our total industrial production is turned out by a relatively few large companies, which, by reason of their size and great resources are able to handle their own health problems, and in a number of cases, are, I know from personal observation, doing a very creditable job of it. Much the greater part, however, of our total manufacturing capacity lies in innumerable small plants, which, by reason of their size and scattered locations, are not in position to do many of the things that are less difficult of accomplishment in the larger industrial plants.

Nevertheless, the problems of these small plants are the same, the prevalence of morbidity is the same, their desire and the need for better health, the prevention of disease, reduction in time loss, are the same as are to be found in the great industrial institutions.

How shall the worker in the small plant be supplied with the safeguards against disease, whether occupational or not, that are supplied in the large industrial plants?

The first step toward an answer is a more general realization that it is a problem that must be solved. To merely admit its existence with a shoulder shrug and say: "Oh! Well! We'll get around to that some day," will not help to solve it. As was cogently stated by Dr. L. D. Bristol in the *A.M.A. Journal* of October 12 last:

"The Health of the industrial worker, one of our precious resources, *must be conserved.*"

The next step takes place around the conference table. You can't come to terms with disease by negotiation. No policy of appeasement will meet the situation. Action, direct and violent and aimed at complete liquidation, even though it may fall short of the mark, is the effective battle strategy. That plan of battle should be mapped at a conference of the leaders in the fight.

The answer to the problem from labor's viewpoint is strikingly similar to labor's answer to so many other problems; namely, there *must* be close, joint, or cooperative effort on the part of all concerned. That answer sounds so simple and direct that it even makes the problem itself appear simple, whereas in fact and in practice, it is not so.

In the past there has been too great a tendency for one group or the other to consider the problem solely from their own selfish point of view. Take, for example, pre-employment health examinations.

The feeling on the part of labor that the prime purpose of such examinations by employers sprang from motives which had little regard for the interest of the prospective employee, was not without some foundation in fact. So long as there is a feeling, amounting to a conviction, that pre-employment health examinations accrue to the sole benefit of the employer and to the detriment of the worker, there is bound to be opposition on the part of the worker. It is the part of such conferences as this to work out a formula by which the advantages, admitted by all, of periodic, thorough health examinations, whether pre-employment or during employment, shall be equitably distributed without prejudice to either employer or employee. The advantages are, as a matter of fact, mutual and also national.

No man, or woman, seeking work, wants to be denied that opportunity because a medical examiner concludes that he or she has something the matter with their anatomy which makes them a poor risk as an employee. Yet, the chief beneficiary of such information would be the applicant for work. How shall we bring that benefit to the most vitally interested party? Accomplish that and resistance would cease.

Not all of the objection to health examinations has been manifested on the part of labor. There has been an equally strong feeling on the part of some of the employers that health examination may promote, or lead to, law suits for damages or for compensation. I have no doubt that such things have occurred.

THE approach to the solution of this problem must be the route of mutual recognition of the rights as well as the benefits involved. Until very recently in New York City, three out of four of all cases of tuberculosis admitted to our sanitoria were received in an advanced or moderately advanced state. Today, under the able direction of Dr. Herbert R. Edwards, Director of Division of Tuberculosis, we are combing large sections of the population by the use of chest x-rays and finding from 0.5% to 3% with clinical tuberculosis. Now three out of four of the cases found and placed under treatment are in the early or minimal stage.

In the past seven years in New York City there has been a decline in the death rate from tuberculosis from 64 per 100,000 of population in 1933 to 50 in 1939, a drop of 22%. A very creditable showing in an area of dense population and overcrowded living conditions. A factor contributing to this greater effectiveness of our present day case finding procedure in New York City has been our wide use of the x-ray as a routine method of examination.

In the old days, meaning only a few years ago, when three-fourths of the admissions to the sanitoria were in an advanced or moderately advanced stage, the mortality rate was correspondingly high and a very large proportion of the cases under treatment were only sojourning in our sanitoria on their way to the cemetery.

Now by finding and caring for the earlier cases a far larger percentage can be restored to useful service in the community, and in a much shorter time.

In New York City a number of our larger unions have participated in this plan by having the chests of their members x-rayed in this mass attack on hidden and unsuspected disease. Nine types of labor organizations were represented. Many abnormalities were discovered. Among them were 244 cases of significant pulmonary tuberculosis in 34,303 members of unions who were x-rayed. Many other lesions, previously unknown and unsuspected, were disclosed. Some of these unions are now planning a continuing program through their own resources.

To carry out such a program involved many problems. In an article published in *Radiology* for May, 1940, Drs. Arthur B. Robbins and David E. Ehrlich, of the Health Department, describe how the method used in New York City was chosen:

"When these group examinations were started, our first problem was the choice of method. Certain requisites had to be met. The procedure must accurately diagnose tuberculosis in the minimal stage which can be done only radiologically; it must be adapted to the rapid examination of large numbers of individuals; it must be possible to carry out the studies in central locations, such as schools, institutions, or clinics, and to move readily from one location to another; the results must be of good technical quality, readily capable of interpretation and review, and the cost must be low.

"Several methods were considered. These included tuberculin test screening, fluroscopy, x-ray examination on celluloid film, and the rapid roll-paper method.

"Tuberculin test screening was rejected because of the difficulty of securing permission for injection, the necessity for several visits by the patient, and the failure to detect non-tuberculosus conditions. In the groups of older individuals, 50% or more are positive, and, therefore, tuberculin test screening is of little value. Fluoroscopy had the disadvantages of being incapable of review and of doubtful accuracy, technically, and was difficult to utilize in large groups in short periods of time. X-raying on celluloid film with stationary or portable equipment was limited in the rapidity with which large numbers of persons could be examined; and, it was too costly. Only the roll paper method satisfied all of our requirements and it was adopted. We have continued to use it in this type of work and have found it completely satisfactory in over 100,000 group x-ray examinations done during the past five years."

In these days of great national effort toward defense preparedness, it would be folly to direct attention so intensely toward production as to lose sight of the essentialness of the man behind the machine as being on a par with the man behind the gun. Of what use is the gun without a skilled man behind it? Of what us is either without the producers that supply the ammunition and a thousand other items of supply? The most ruinous of

fifth columns would be lowered health standards among our workmen.

It seems trite to say these things. You and I know them so well, but the rank and file, the man of the street, the average worker, does not yet realize and recognize these facts, namely, that an ounce of prevention really *is* worth a pound of cure. That health is his greatest asset and ill health his greatest enemy. That only when in good running order is either a man or a machine useful. That the greatest essential of well being is being well. That both capital and labor have a huge stake invested in the health of every workman, and that both lose vast sums annually on account of ill health. That much of this enormous loss is preventable, just as accidents have been proved preventable. That the great reduction in the accident rate in industry was not brought about by the sole efforts of either group, but by the joint efforts of employer and employee. That health in industry can be conserved and retained only by the joint efforts of all concerned. That the cost will be but a fraction of the gain.

It is good business to keep healthy.

From the Viewpoint of:

Employer-Employee Relation

W. E. ODOM,
W. E. Odom Associates, Chicago

ABOUT 15 years ago, I was asked to make a speech, and I very carefully and conscientiously prepared a speech. I revised it several times, committed it to memory. Oh, and it was a honey, too! On the day of the convention, I was just a little bit nervous, so I decided to read it and be sure I was right. I thought it was good.

But, on the following morning, I was sitting down in the restaurant, and two of my alleged friends were having breakfast right behind me at an adjoining table. I couldn't help overhearing their conversation, and it ran something like this. "Sam, what did you think of Odom's speech, yesterday?" Sam said, "Well, there were three things about it worth commenting on. In the first place, he read it. In the second place, he read it poorly, and in the third place it wasn't worth reading."

So, my speech today consists of a series of very rough notes. I have a confession to make. I thought perhaps being on in the afternoon, all I would have to do was come over in the morning, sit and listen gravely to what the other speakers had to say, and I would know what to say and what not to say. But, one of my clients got on the telephone and I had to be absent from about five minutes after Mr. Heacock started to speak. So, the only thing I can say about what happened this morning, has to do with the first few remarks by Mr. Heacock. I understand in some of the discussions, further reference was made to the dollars and cents aspect of industrial health.

Now, strange as it may seem to you, I am one of those poor devils who tries to get employers to do something about industrial health. I have never yet been able to get an employer to go along with me by my request to put in an industrial health program unless I could show him something about the balance sheet that would justify him in taking the expenditure up before the board of directors. So, I don't think we need to apologize for approaching the industrial health program from the dollars and cents standpoint.

Let us take one element of the economics involved. Let's take a look at the cost of absenteeism. We talk a lot about it, but what does it mean? I had an occasion not so long ago to make a study of what was involved in absenteeism. This was in a very small plant, little over a hundred employees, but I got some rather interesting figures.

The average wage paid to the hourly rated employees—notice, I don't call them workers. I don't like to say that the non-productive employees are not workers. I don't try to make a distinction between the workers and non-workers, because I think a lot of us do have to work. The hourly rated employees were receiving an average wage of 74 cents per hour. I found the investment necessary to operate the business to be a little bit in excess of $5,000 per employee. But, $2,500 per employee represented the cost of machinery, mechanical equipment, and so forth. About the same amount represented the cost of building, land on which it was erected, and so forth.

If the investment per employee is approximately $5,000 per person, and we determine that, say, 5% is all that we could hope for to realize in the form of a net return on our investment, it means that there must be a return on that investment if a work place is to be provided for the employee. If we consider 5% of our $5,000 investment as a fair return, that means that the employee's job must provide, say, $250 a year, if we are to continue to provide the work place.

The machine that the man runs; the equipment that is necessary for him to perform his work, represents an investment of $2,500, more or less. Usually that must be written off in a period of 10 years. Obsolescence and depreciation, therefore, amounts to approximately $250 a year. There is approximately $500 a year cost to the employer for providing a work place for an employee.

Now, there is an additional cost of providing a work opportunity for the individual employee. You know, when you hire a person and put him on the payroll, the direct wage that you pay to that individual represents but a small part of the total cost involved. One of the means that you may use, if you care to do so, to determine the cost of providing a work opportunity, is to make an analysis of your labor costs and losses. Here is a very simple device you can use for that purpose, and I am going to read to you some of the items that represent a cost to the employer of having an individual on his payroll.

Among the more important of those costs may be included liability and compensation insurance premiums; employees sick pay; life and health insurance costs or your mutual aid society costs; vacation pay; bonus and profit-sharing payments;

unearned pay to superannuated employees; retirement pay; cost of employee pension plan, if you have one; employer's old age benefit payroll tax; unemployment compensation tax; the personnel department salaries; the personnel department overhead—that is, the provision for space and budget requirement; payroll department salaries; payroll department overhead; salaries of rate setters and other incentive operators; accounting overhead to operate the incentive wage plan; cost department; a certain share of supervisory salaries; cost of space devoted to lockers and washrooms; the losses encountered in operating the lunch rooms and cafeterias; other employees service and benefit costs; association membership that the employer maintains simply by being an employer; services bought because of being an employer; and the license fees and taxes paid in behalf of employees, and a long list of similar items.

The cost of providing work opportunity is even greater than the cost of providing a work place. Now, when an employee is absent, the cost to the company may be calculated somewhat along this line on the assumption that the employee is supposed to work 2,000 hours a year on a 40-hour week. If there is an investment, obsolescence and depreciation charge of approximately $500 a year to be met before the employee or the machine can begin to produce his own wage plus the cost of materials, operating the business, profit to stockholders, and so forth, that individual must turn out an overhead charge of about 25 cents an hour simply to meet the cost of providing the work space and the work opportunity.

When the employee is absent, those costs continue just the same. They don't stop just because the man is home sick or because of occupational injury. There is another cost involved which, for lack of better term, we can call the loss of production, interruption to the productive effectiveness of the plant. Some actual figures that I gathered not so long ago indicated that for one hour of absenteeism on the part of the employee in this particular operating establishment, the cost of providing the work space was 25 cents an hour; the cost of operating the employment opportunity was 37½ cents an hour; and the cost of production losses was about 16 cents an hour, or a total of 78½ cents an hour. That is in excess of the average 74 cents per hour paid to productive labor.

On the basis of approximately 3%, as the ratio of absenteeism, the cost of absenteeism to the company on just that basis alone is $47.10 per man per year. In an establishment employing a hundred men, that, of course, is $4,710. Now, that is the cost to the employer, measured by rule of thumb formula.

THE employees have a cost, too: The loss in wages; cost of their medical service that they pay out of their own pocket in the case of non-occupational sickness, and so forth; the burden of debt they encounter; worry that comes from assuming the burden of debt. It is quite possible the employee's cost resulting from absenteeism even exceeds that of the employer. In the case of a plant having a hundred employees—and you can use the same figures whether you have 1,000 or 10 employees. If you have only 20 employees, take 20% of the figure I am going to give you.

The health of a man working in a small establishment is just as important to him as though he were working in a plant having 5,000 employees. In a plant having about a hundred employees, the cost of absenteeism at 3% rates for the year is approximately $9,150.

Now, I submit that an industrial health program can reduce the cost of absenteeism by reducing the amount of absenteeism, and that a very small part of the cost of absenteeism would represent a very handsome budget on which to operate an employee medical program or an industrial health program, if we can use the broader term.

In speaking of budgets, I wonder when the time is coming that the medical department will set up a budget on which to operate? I hope one of the functions of this organization will be to furnish a budget for the medical department to operate on, so we can know ahead of time the expenditures that the department wishes to make in the course of the year.

Therefore, instead of saying to the employer: Our industrial health is not a matter of dollars and cents; it is a matter of being a good fellow to the employee—I say, horsefeathers! It is a matter of dollars and cents and the benefit to the employee, although greater than the benefit to the employer, is not the justification that the management needs to institute and maintain an industrial health program.

NOW, the question may be asked, why do we interest ourselves in the health of the employee? Why don't we just sit tight and let the New Deal take care of that thing, just as they have taken care of other things in the last few years? Well, I don't know how you feel toward some of the ideas that came out of Washington, but I, personally, would rather be in the driver's seat, steering the program, than sitting tight and doing nothing and letting some of the fair-haired, starry eyed reformers in Washington tell us what to do, and take what they give us and like it. I think we ought to institute and maintain our own industrial health program. If we don't, we have to take what the other fellows give us.

But, more than anything else, we are the ones that have to live with our employees every day. Those of you who are in industrial occupations and any phase of management at all, don't have to be told what a licking the employer has been taking during these recent years. He has been kicked around so much that he has lost all semblance to leadership he used to have. I think it high time that we restored to management the prestige that goes with leadership.

I can see in industrial health and the programs that employers and the medical profession put forth to control employee health, one activity that the employer can pursue without apologizing to Washington or anybody else. It is one thing we can do without being ashamed of it. I am not

going to presume to talk to you about the way you ought to conduct a physical examination. However, I do sometimes get fed up with the doctor who conducts an examination and then looks down his nose and grunts at you, and says, "All right, take care of this and you are all through. Goodbye."

Why, in the name of heaven, can't we take a little bit of time and talk to the man about what we found when we conducted the examination? This last summer I had a case of arthritis. Of course, I went over to the family doctor and I him as a doctor, because I didn't know him. I said, "Say, I have a pain in my leg." He said, "Come on over to my office." I did, and he gave me the works. It took him possibly 15 minutes to make the examination and 40 minutes to tell me what it was all about. But, of all the silly things I ever heard, I had a pain in my right leg and he told me to go home and take some nose drops. He explained how the sinus affected the blood stream, etc., and that is how I got the pain in my leg. If my family physician had told me to take nose drops for a pain in the leg, I

JOB FACTOR ANALYSIS

JOB NUMBER	JOB TITLE	ALTERNATE TITLES	DEPT.	NORMAL FORCE
147	Electric Welder--Shop	Welder, First class	Reports to Welder Foreman	5

GENERAL DESCRIPTION Welds cracked and broken bases, rods, support brackets, etc. Repairs salvaged parts and rebuilds worn surfaces.

MENTAL EFFORT	SKILL	PHYSICAL EFFORT	RESPONSIBILITY	WORKING CONDITIONS
7 YEARS GENERAL EDUCATION KIND OF SPECIAL EDUCATION Read and write English KIND OF WORK KNOWLEDGE Effect of heat and electric current on metals MATHEMATICS USED Fractions and decimals X HIGH INTELLIGENCE NEEDED R Read blueprints INSTRUCTS OTHERS RECEIVES CONSTANT SUPERVISION PREPARES RECORDS MONOTONY X DISTRACTIONS Emergencies PERSONAL QUALITIES NEEDED Unexcitable	KIND Resistance Welding of joints; "Melting in" metals by use of carbon electrodes (arc welding) TIME TO ACQUIRE 3 years DESIRABLE PRIOR EXPERIENCE Journeyman Acetylene welder or welder's helper PRECISION OR WORK LIMITS Seldom closer than 1/16" CO. JOBS WHICH TRAIN FOR Welder "B" or helper	KIND OF MUSCULAR EFFORT Holding electrode; Lifting small parts 60% standing 20% bending REPETITIVE OR INTERMITTENT Intermittent Rest periods between jobs AGE LIMITS 25 TO 45 MIN. HEIGHT AND WEIGHT 160 SEX Male COLOR ABNORMAL FATIGUE OTHER PHYSICAL FACTORS Strong lungs and eyes R Visual color discrimination A Rating medical examination	KIND OF EQUIPMENT Welding machine, carbon electrode, table, shield, small sand blast KIND OF TOOLS Files, goggles, gloves, hammer KIND OF MATERIALS Iron, steel, brass and aluminum KIND OF PROPERTY FOR SAVINGS—HOW Salvaging old parts FOR WORK OF OTHERS OTHER RESPONSIBILITY	PLACE Indoors TYPE Bench--floor SURROUNDINGS Dirty and crowded ATMOSPHERE Fumes--draughty ILLUMINATION Very poor HAZARDS Burns, shocks, and eye strain HOURS 7:30 to 5:00 REGULARITY OF EMPLOYMENT Good OTHER

SYMBOLS—X TO INDICATE; XX TO STRESS P PREFERRED; R—REQUIRED OR SHOW PERCENTAGE, AS 75%

PREPARED BY E. B DATE 2/3 APPROVED

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said, "I have got a pain in the back of my leg. Get rid of it." He looked me over, and said, "Go on home and put a hot water bottle on it and you will be all right in the morning."

I went home. I hate a hot water bottle, but I put it on. It got cold during the night, and I didn't wake up to renew it, so when I got up in the morning my leg was still sore. The doctor knew what he was doing, I suppose, but he didn't convince me, the individual, that I ought to follow his directions. So, I went to another doctor, a more recent graduate. I had met him in the corner drug store. He was just a youngster, as it were, and I didn't have much respect for would have told him to go to hell. But, the other fellow sold me on the idea. So, I sniffed the nose drops, and in a few days I felt fine.

If we say the employee must be sold and the intelligent cooperation of the employee is necessary in order to put over an industrial program, let's start with him and tell him why. We can't kid him very long, you know. He is beginning to catch up with us.

Most of this speech I made up at the luncheon table in discussion, rather informally, with a group of folks that got together. There was one other monkey-wrench personnel man and two doctors. "We can't get away with pre-employment physi-

cal examination. Our union won't let us." Without thinking, I blurted, "You have done a damned poor selling job with the union."

I think that is right. We ought not crane down their necks, and invade their privacy. We ought to be in a position where the employees come to us, if we are not already carrying on that activity, and say to us, "Why don't you provide preemployment physical examinations and periodical follow-up examinations, and all these things?"

We ought to go out of our way to sell the idea to the unions and individual employees. Don't send notices home. Don't put notices on the bulletin board to get all fly specked. Start with the supervisory forces and tell them what it is all about. Take a year, if necessary, to teach to the supervisory forces, the foreman, the group leaders, what we are thinking about; what we are trying to get at in these kinds of meetings, so they can translate it in their own language and take it back to the plant and talk it over with their associates. Before we finish with the educational program of the supervisory forces, the rank and file will come to us and ask pointedly, why don't we get something started along this line.

Just two weeks ago, I had the pleasure of discussing with an employer the result of an industrial hygiene inspection that Dr. Sappington had made. It was a voluminous thing, about 40 pages. The first thing that he intended to do with that report was to take it to a meeting of his employees,—not to the chairman of the board, no, but to a meeting of the employees. I said, "That sounds like good sense."

NOW, without any further ado, I am going to skip the rest of things I was going to say and I am going to ask the medical organization and the lay organization that are represented here to get a little bit closer together in your demands upon medicine. I am just a little bit bothered that there are so many organizations of individuals asking the doctors to make physical examinations. They are making the same kind of physical examination for a foundry laborer as for an office draftsman. I think it high time that we began to study a little bit the jobs for which we are hiring men and to analyze just what those jobs are and give a copy of the analysis, if you please, to the doctor so that he can conduct his physical examination in an intelligent sort of way.

Here is such an analysis (see p. 613). We have broken the job down in its five basic factors, and there are no more than that: the mental effort required of the employee; skill; physical effort; responsibility he must accept; and working conditions under which he must perform his work. Those are the five basic work factors. There are no more. Of course, you can relate those to the four values of the employee, if you wish, whether those values be the physical values, mental, social, or mechanical values.

When this kind of job factor analysis is made and a copy of this is handed to the physician who is making the examination or who is being paid, if you please, to prevent the occurrences of industrial acidents, industrial diseases, or, perhaps, as in the case of some of the hygienists, being paid to prevent employee illnesses of the ordinary variety, he is in a position to cooperate with you and do a more intelligent job. You cannot expect the doctor to go out and do this. This must be done by the plant engineers. The personnel men can do it, but the doctors are the ones that can use it to good advantage. It is not primarily designed for doctors' use. It is designed to assist in establishing wage rates, and so forth, but let me call your attention to a couple of things I found on it.

This is a description of the job of an electric welder. He has to lift weights not to exceed 20 pounds, which isn't bad. But, it is 60% standing, 20% bending, and 20% sitting down. That certainly is not the same physical effort required of a stenographer or typist and should not require the same kind of examination.

Down at the bottom, I notice the fellow who made it out, said one of the requirements is having strong lungs. I don't know how you are going to measure the strength of lungs, but perhaps the medical man can interpret it in some way that will mean something when he is conducting the examination. Under working conditions, the work is done in-doors; shop and bench work; surroundings noisy, dirty and crowded; atmosphere dusty and drafty; illumination poor; hazards: burns, shocks, and eye strain.

With that kind of analysis in front of him, the doctor has some chance of conducting a fairly decent physical examination. I just want to leave one more thought with you. It is this thing about the common, ordinary illnesses. I go back about 25 years ago in Wisconsin, and I found a lot of employees up there who never even heard of silicosis; and then, almost overnight, a few years ago, they were just flooded with claims from everybody who had a bad cold or a chest ache of any sort. "I have silicosis,"—and they got five or six thousand dollar awards. Just a couple of weeks ago, Dr. Sappington dug up a new one—new to me. He was out in a plant where some lacquer was being used. In talking to one of the employees, he asked, "Does the smell of the gases ever bother you?"

The fellow replied, "It doesn't bother me, but some of the folks around here get lacquer wacky at times and they have to go outside and breathe some fresh air or they will keel over." I submit there is an indication that within the next couple of years there will be an occupational disease listed in some of the states which, today, we call "lacquer wacky." In other words, isn't it high time we looked over our working environment to see if there are conditions that affect the health and well-being of the employee? When we make that study and find the actual potential or legal hazards, let's have sense enough to tell the employee what we have found. Let's say to him, "This condition is dangerous, so we will put this

protective device in and we want you to follow these rules. If not, this is what is going to happen."

But, if there is no danger, tell him: The doctors found this; the industrial hygienist found this; and so on: "You have nothing to worry about, so don't fret about getting some kind of a disease."

From the Viewpoint of:

Finance and Cost Accounting

A. W. TORBET,
Frazer and Torbet, Certified Public Accountants, Chicago

THIS conference has been discussing a very vital question. I feel honored to appear on the program.

The matter under consideration is one primarily relating to social welfare and any attempt to discuss the practical value of social welfare activities must necessarily involve numerous problems. This is particularly true in presenting the subject from the viewpoint of finance. At the time I accepted the invitation to discuss the practical value and application of industrial health work from the viewpoint of finance and cost accounting, I did not realize the problem involved in this discussion, particularly the nature of the subject matter which should be included in the discussion.

As we in this country are living under a system of capitalistic economy, my presentation of the subject assumes the continued existence of a capitalistic economy. I believe, however, that much of the subject matter of this discussion would be applicable to any system of socialistic and communistic economy.

Cost accounting pertains to record keeping. The function of cost accounting in connection with the practical value of a social activity is to record data for the purpose of determining or measuring the value of the activity. Its place in this discussion must, therefore, be limited to:

1. Record the cost incurred in connection with industrial health, and
2. Compute, if possible, in terms of money the benefits resulting from the industrial health work.

I am, therefore, taking the liberty of restating the subject—The practical value and application of industrial health from the viewpoint of finance.

Before proceeding with the discussion of the subject permit me to make a brief statement regarding a fundamental matter. From a financial viewpoint the operators of any business enterprise are charged with the duty of conserving the funds placed in their hands and investing such funds in facilities and using such facilities for the production and distribution of articles which can be sold to the consumer at a price which will permit the enterprise to pay all cost and expenses and return to the investors a profit or income. From the viewpoint of finance, therefore, any subject must be discussed in the light of the effect any activity will have upon the conservation and use of funds.

In considering the subject, several questions arise:

(a) Should the viewpoint of finance be disregarded in discussing any activity which primarily is a matter of social welfare?

(b) Is there any practical value of industrial health work from the viewpoint of finance?

(c) Can the practical value of industrial health work be measured in a manner which will permit evaluation from a financial viewpoint?

(d) Should any attempt be made to evaluate matters relating to social welfare?

Should the viewpoint of finance be disregarded in discussing any activity which primarily is a matter of social welfare?

FROM an academic standpoint, this question might be argued pro and con almost indefinitely. It is my feeling, however, that the viewpoint of finance should not be disregarded in discussing any activity which is primarily a matter of social welfare. Under any system of capitalistic economy, the investment of investors must be preserved and investors must receive an income. The gross income of any business enterprise is received from the consumer. From the amount obtained from the consumer the enterprise must pay all cost of operation. It must provide for the return to the investor of his investment in the enterprise at the end of the life of the enterprise and in order to do that a portion of the consumer's dollar must be set aside to amortize the investment in any assets which are diminishing in value through the use or lapse of time. A portion of the consumer's dollar also must be returned to the investors for use of the capital employed. Any social welfare activity which increases the costs and expenses of production or operation of any enterprise eventually must be reflected in the price of the product which the consumer pays. Support of all social welfare activities comes from business and agricultural enterprises but primarily from business enterprises. The continued support is dependent upon the amount of the consumer's dollar which the business enterprises can afford to allocate to such activities. It may be argued that the funds which can be utilized for social welfare activities are almost unlimited in view of the fact that such cost can be added to the price the consumer must pay. There is a limit, however, to the price the consumer will pay for any commodity and there is a limit to the amount which can be expended for social welfare activities.

Finance in the broad sense relates to the balancing of the amount paid by consumers and the allocation of such amount to cost of production and distribution and in support of all governmental divisions.

It is my conclusion that the viewpoint of finance cannot be disregarded in considering any social welfare activity. If the viewpoint of finance is

disregarded, I believe that eventually social welfare activities necessarily must disappear.

The conclusion stated is, I believe, equally applicable to any system of economy because the total income of all business enterprises and governmental bodies is dependent entirely upon the price which the consumer pays.

Is there any practical value of industrial health work from the viewpoint of finance?

I BELIEVE that the other speakers who have discussed the practical value and application of industrial health work from the viewpoint of the employer, the physician, the industrial hygienist, the insurance company, the legal profession and labor have shown conclusively that industrial health has a practical value to manufacturing, commercial and other types of business enterprises. The practical value of any activity from the viewpoint of finance must be based upon the effect the activity will have upon the continued success of any business enterprise. As the continued success is dependent upon the ability of the management to limit costs and expenses to an aggregate amount which will be less than the income received, the value of the activity must be measured in terms of its effect upon expenses and income. The measurement of the effect, however, need not necessarily be determined with mathematical accuracy. Any social welfare activity, including industrial health work, entails an expense and this expense must be met by business enterprises. If the activity is conducted by one enterprise or a group of enterprises, the amount of the expense is definitely ascertainable. If conducted by governmental bodies, the expense exists although the extent of the expense is buried in the taxes paid by the several enterprises.

From the viewpoint of finance the measurement must weight the possible benefits to be received from any expenditure before the expenditure is made. That, of course, raises the question: What benefits are received by any business enterprise from any social activity and can the benefits be measured with such a degree of certainty that the management can justify the expenditure in reporting its activities to the persons who have entrusted their funds to the management. The viewpoint of finance toward social welfare activities is presented in the question just stated. I believe that you will conclude with me that there are some difficulties in answering the question. From my review of the results which have been accomplished in the past and which may be accomplished in the future from industrial health work, it appears that the benefits accruing to any one enterprise are dependent not only upon the improved working conditions in any one plant and living conditions of its employees but are also affected by the working conditions in all plants in a community and the general living conditions in the entire community. Each business enterprise benefits not only from the improved living and working conditions affecting its own employees but also benefits from the improved conditions of the employees of other enterprises. The improved conditions brought about by one employer may be minimized to some extent by poor working and living conditions of employees of other enterprises. Perhaps the difficulty respecting the determination of value of industrial health work just cited might be overcome by having all industrial health work under a governmental body. That might be the solution but any increase in government activity is one step further toward a socialistic or communistic economy.

It is recognized, I believe, that improved working and living conditions result from industrial health work. It is also recognized, I believe, that workers whose living conditions are satisfactory have fewer days of absence due to sickness and that the operation of a manufacturing plant and of a mercantile establishment is much more efficient if the same workers are employed and if it is unnecessary to substitute workers on certain operations because of the absence of certain of the workers. It is also recognized, I believe, that increased efficiency results from improved working conditions and the elimination of dust and other hazards to the health of the workers. As evidence of the practical value of industrial health work, I wish to call your attention to the industrial health activities sponsored by many of the large employers in this country.

Can the practical value of industrial health work be measured in a manner which will permit evaluation from a financial viewpoint?

FROM my experience and some discussion with others in the accounting profession and discussions with industrial and commercial executives, it is my belief that up to the present time no one has been able to make any computation which approaches accuracy respecting decreased costs, increased efficiency, increased earnings of workers and increased income of investors which have resulted from industrial health work. It is known, however, that workers whose living conditions are satisfactory have fewer days of absence due to sickness and, of course, receive larger annual earnings if they are working more days in the year. It is also known that the operation of a manufacturing plant and a mercantile establishment is more efficient if the same workers are employed and if it is unnecessary to substitute men on certain operations because of the absence of certain of the workers. No satisfactory method has yet been obtained to measure the results secured from the more efficient operation. Lowered compensation insurance rates are one definite result in industrial health work which can be measured.

To attempt to state that a method can or cannot be developed in the future for measuring with some degree of mathematical accuracy the monetary value of industrial health work would require more prophetic vision than I possess. The successful operation of any business enterprise requires the creation and maintenance of customer and community goodwill. The matter of

industrial health work is closely allied to the creation and conservation of goodwill. The matter of goodwill is, of course, very intangible. In this connection mention also should be made to the fact that many enterprises find it necessary to take steps to offset ill will created not by things which the enterprise itself has done but created by the loose and inaccurate statements made by many persons engaged in political activity. This is a matter which has been considered by many persons engaged in industrial activity and perhaps is somewhat related to the general subject of industrial health work, and the several benefits which may accrue from such activities.

Should any attempt be made to evaluate matters relating to social welfare?

THIS is another question which might be debated for hours without reaching any definite conclusion. I shall not attempt to answer this question but in closing leave it to you for further thought.

Let me recommend that in considering this question you keep in mind the fact that the amount paid by the consumer must be inclusive of all expenses of production and distribution, all costs of government and all costs of social activity. While consumption for a time may exceed production that condition cannot last indefinitely. Cost and expenses cannot exceed income and income is dependent upon production.

From the Viewpoint of:

Selecting the New Employee

A. G. Trembly,
Chicago

IT IS a pleasure and a privilege to talk with you for a few moments this afternoon from the point of view of the person who carries the responsibility for selecting new employees for an industrial organization for it seems to me that is the point at which industrial health work begins.

Let us note that this is a function which must be performed in every organization. Although size will influence the type of set-up for selecting new employees, there are several matters which cannot safely be overlooked by any organization no matter what its size may be.

In the first place I believe the employment man should ask the applicant to make application in his own handwriting. This is not to get a sample of his handwriting but has other uses. Most firms have blanks designed for their own use, but firms whose volume of hiring is small can procure a small pad of application blanks from any well stocked stationery store or can make blanks on the mimeograph or hektograph.

By having the applicant fill out the blank in his own handwriting, preferably in ink, you secure a statement from him which he finds difficulty in disclaiming or altering at a later date if temptation to do so arises. In some cases this has been very valuable when false claims have been attempted.

Most application blanks give the man's employment history through three past employments. A good interviewer will check this past record quite carefully, not only because it gives him some index of the man's experience, but also because it may be suggestive of the disease hazards to which the applicant has been exposed. A good interviewer will check a man's claims of service with previous employers, and will gain such information as he can from those companies. Previous employers' statements as to the man's qualifications are none too reliable but they certainly will establish the fact that he did or did not work at the places claimed and that he did or did not do the type of work claimed. Trying to trace a man's employment history after he has gone out of your employ on account of some ailment for which he attempts to hold you responsible is sometimes very difficult yet may be of tremendous importance to you. Get an accurate record of the man's employment history *before* you hire him.

At this point I would like to call attention to the increasing use of tests for selection. Many large organizations find it profitable to maintain rather large personnel research departments staffed with psychologists, statisticians, and other specialists to develop tests and make other studies in regard to personnel. Smaller organizations sometimes find it profitable to have one person engaged largely on work of this sort. In still smaller organizations it is sometimes possible to secure a personnel director, who, in addition to knowledge of employment office routine, has had training in psychology and in test procedures and can develop or at least assist intelligently in the development of tests for use in selecting employees. Where such man is not available it may be feasible to have the tests developed by an outside specialist who can train some member of the organization to administer them properly and interpret them wisely.

Much has been made of trade tests. We can understand the sense in asking a girl who applies for work as a typist to do some certain amount of typing which can be timed and scored, and the score checked against scores made by many other girls. Excellent clerical tests have been developed and are growing in facor. In the machine shop, if you can do no better, provide the interviewer with a micrometer, a drawing of some small part, and a sample of the part. The interviewer, then, does not ask "Can you read a blue print? Can you use a micrometer?" but simply lays the three items in front of the applicant and asks if the part is made as per print. The applicant cannot give a stereotyped "yes" to such a situation but must demonstrate that he does or does not know how to read the print and handle the micrometer.

For applicants who may have had little or no experience but who are desirous of learning some certain trade or profession there are very good aptitude tests. Some of these give the applicant a collection of mechanical problems with which he can display his mechanical aptitude. Several

which I have seen developed recently have been quite successful in picking out the persons who had aptitude for salesmanship.

Temperament has more to do with success on a job than many have realized. The terms extrovert and introvert have acquired a place in the vocabularies of a considerable portion of the public and I am sure need no explanation before this audience. Tests for extroversion have been helpful in selecting salesmen, as have many others. Humm-Wadsworth and others have shown the applicability of temperament scales in the selection of persons for a great variety of jobs.

It might be thought that, in the machine shop, temperament doesn't matter, but, haven't you all seen the machinist who is always sure that his foreman "has it in" for him and who finds the same situation no matter who the foreman may be. That machinist may be the source of a lot of disturbance. I don't want to say too much about that type of personality for we have a psychiatrist on the program and I am hoping she may say something about it.

I have a great deal of respect for the work being done by the psychiatrists in industry, but I suspect they would have somewhat less to do if the man who selects the employees in the first place, would do a better job of selecting employees for the types of work for which they are best adapted, are most interested in, and at which they will find greatest satisfaction.

THE person who selects the new employee usually sends him to a doctor for physical examination before hiring him. To omit this step is to hire liabilities.

To me, it seems important that the doctor should know what sort of work you propose to have the man do. It is not sufficient to tell the average neighborhood doctor that you propose to hire the man to run a centerless grinder, for the doctor may have no knowledge whatever concerning such a machine. I believe that the doctor who is to do your physical examinations should see the inside of your plant occasionally and should have some understanding of the different types of work and the different health hazards which may be related to each. A previous speaker showed a diagram of a job analysis sheet which provides space for showing a list of the accident and health hazards. Maybe the doctor can have a file of these which he can check when examining an applicant. He can then give special attention to those elements in the applicant's physical which would be most susceptible to injury by the environment.

Perhaps the employment man is justified in hiring for some positions, a man whose lungs have been checked by the stethoscope method. However, if the man is an applicant for a job as a dry grinder and has a history of dry grinding and sand blasting, the employment man is hardly justified in hiring him until the doctor has reported what findings result from an x-ray of the man's chest.

It is highly important that adequate records be made of the results of each physical examination. If the applicant is sent to an outside doctor, the complete record usually comes to the employer by mail, the doctor keeping a carbon copy. If the doctor is on the staff within the plant, the complete record stays in his office. In either case the employment man usually sends the applicant to the doctor with a slip asking for physical examination and stating the type of work for which the applicant is being considered. The doctor, after examination, sends the man back to the employment office with the slip which then bears some code markings. I have used, and found satisfactory, a basic code of four letters, A to indicate a man physically tops in every respect, B to indicate a man having minor defects of no great importance, C to indicate doubtful cases which might be used for limited numbers of jobs, while D indicates that the applicant has some very serious defect which makes him definitely unemployable Supplementing these letters I have found that a code of numbers is useful, the figure 1 for example might indicate relaxed rings suggesting to the employment man a potential hernia case and therefore that it might be unwise to put the man on work which would expose him to heavy lifting or severe strains. The doctor might indicate a weight limit. A number 2 might indicate a lung condition, or some heart condition and so on. Such marks can be put on the slips handled by the applicant without giving him full details about his condition. The marks may suggest the advisability of a special consultation between doctor and employment man at which the latter may secure more detail and advice before he makes a final decision.

Earlier in this paper I said that I believed a doctor who makes physical examinations for the benefit of the man who selects new employees should have some knowledge of the plant and the operations performed there. Similarly I think it important that the employment man have some knowledge of those physiological facts that would influence hiring. He should have some idea of what physical deficiencies make the man unsuited for certain kinds of work in the plant and what ill effects might result from a mistake.

In all this talk I hope I have not given the impression that I think an applicant need be physically perfect in every way before he can be hired. I know there are some companies which have adopted such a policy but I cannot agree that it is a good one unless there is a very unusual situation. In some cases I would be willing to hire a "C" man for a job which I could be sure would not aggravate his condition.

In some cases it is permissible to hire a man conditionally. Let us suppose the doctor reports that a man seems to be in good shape except that he has very bad teeth. I have frequently hired such a man on condition that he will start dental treatments within, say, two weeks and will be all fixed up within, say, three months. Of course there is a follow-up to see that he does it.

If some applicant shows up with a slight fever, it is suggested that he return next day for a recheck. Frequently the recheck shows him to be all right, and he is hired.

In handling applicants the employment man should make it clear at all times that the spirit of this whole matter is to do whatever is best for the man as well as for the company. No man should be allowed to do work that will prove dangerous to his health and most men are fair enough to admit it.

Others on this program will speak on safety, nursing service, maybe hospitalization plans or plans through which benefits are paid to employees who are absent on account of sickness. It is not my function to discuss the merits of those matters but I do want to call attention to the fact that, if a company does have some such plans in operation, the employment man has a duty to explain them to the new employee.

It is an excellent plan to have some sort of small booklet which may be handed to the new man when he is hired. Such a booklet explains the plans and gives the rules concerning them. It tells the employee what he is expected to do in case he needs to take advantage of any of them. I think it is a good gesture to ask the man to sign a receipt for such booklet, to read some of the contents with him, and encourage him to take the book home and read it to his wife so she will know about it. Reading the details to his wife will help to fix them in his own mind and it is a fact that it is desirable that the wives understand the workings of the plans. Wives are great conservers of family health and it is well to have their cooperation and support in any health program. They will cooperate with any plan they understand.

One more point and I am through. It is a common thing for employment departments to keep the records of each employee showing when he was hired, his transfers, pay raises and other matters about him. I would like to recommend that along with this collection of records there be put records of absences and reasons therefor. Such a record can be made on a small and simple form and the man can be asked to sign it. If the man is absent frequently it may very important to know why. Occasionally you will find a case of frequent absence on account of occupational conditions of some sort. Such check up may bring to light some condition in the plant which can be corrected.

The practice of keeping records of reasons for absence sometimes heads off threatening cases where employees claim they contracted some disease while in the company's employ on account of certain alleged bad conditions and they point to their frequent absence over a period of weeks or months before separation from the payroll as evidence that their health was being affected. Absence of records in such cases may necessitate a very expensive investigation to meet the claims which the company may feel are not legitimate but which it may have difficulty in disproving. I have seen several cases of this kind.

When one considers current developments in the industrial world, the rush of the defense program, the sudden need for large numbers of skilled men, it is evident that, instead of men begging us for a job, we are going to be begging them to take one with us instead of with our competitor. In such cases the companies who have developed good industrial health programs, whose plants have the reputation of being healthy places in which to work will have an advantage when the employment man goes hunting for help. Such meetings as this one here today show a trend in that direction. The large attendance certainly shows that there is much interest in the subject and I think forecasts a rapid development in industrial health programs.

From the Viewpoint of:

Safety

J. D. Berman,
Director Health and Safety,
Western Electric Company
Chicago

THE definition of a "pinch hitter" in baseball vernacular is generally a ball player lacking some or most of the qualifications or abilities of those participating, yet who, in a pinch, may be called upon in the hope of producing the needed hit which results in the start of a rally that may win the ball game.

In this morning's session and up to now, the industrial health workers' team has made so many hits and scored so many runs that in my opinion there is no need for a "pinch hitter."

The practical value and application of industrial health work from the viewpoint of safety, as stated in your program, was assigned to my friend, Frank Lauermann.

Frank still had a needed vacation due him.

Personally I think Frank, in one general sweeping glance of the program, noted that those who preceded him would, regardless of the title of their talk, cover his subject—"Safety"—so well that there was absolutely no need for him to "endanger" his personal industrial health by further delaying his vacation—and away he went.

That, gentlemen, I submit, is a good example of the application of the practical value of industrial health work.

In this morning's session Mr. Moore presented to you what, in my opinion, was not only "The Employees' Viewpoint," but also a rather complete picture of our thinking, procedure, and what we feel is our major problem.

It may be pertinent to emphasize a few of his general statements. For instance, for the entire year of 1939 we had just one lost time case classified as "occupational." There was a total of *103* temporary partial cases or *nine* cases per 1000 employees per year. The nature of the cases, the parts of the body affected, and the days involved are as follows:

Injuries

SOME of the cases classified as injuries might well fall into occupational classifications and into a field open for further study. But that's

another story. Yet, when mentioning the following the aforesaid thought may be running through your mind.

Hawthorne experienced a total of 73 lost time injury cases in 1939. A frequency rate of 3.30 per million hours of exposure. Nineteen of these cases involved falls away from the employee's working location—on level surfaces, curbs, stair landings, and traveling up and down stairs—by both men and women.

In 1939, and 1940 too, our accident frequency rate included such cases as follows:

An employee walking between a row of desks and the outside wall of a building notices that part of the window shade cord somehow has slipped in between his arm and his body. He isn't really entangled with the cord, but he steps back to release the cord. As he does so he gets a pain in the neck, and we get another lost time case.

This case was rather far reaching. It gave all of us a pain in the neck.

A foundry laborer is just completing handling a shovel full of sand from a pile. As he steps back he experiences a pain in the back. A lost time injury case. Examination showed infected tonsils.

Another is about to put his foot on a shovel to get a shovel of sand. He too experiences a pain in the back. Another lost time injury case.

Still another using a wrench on a three-quarter inch nut experiences a pain in the arm. A lost time case. He has arthritis.

In the main, however, I think that you will agree that in neither the accident rate of 3.3 or in the so-called occupational class rate of nine per 1000 employees per year is there anything which we cannot better or at least hold to its present rate by continued further effort.

Before leaving our two friends, "O.D." and Old Man Accident—friends only because they're "bread and butter" to so many of us, I wish merely to mention a few of the means used to help reduce or eliminate them.

Occupational Disease Examinations

ALL employees engaged in work or processes where there is a chance of injuring themselves or others, are subject to periodic physical examinations either monthly, quarterly, or upon call.

A list of various work includes such classes as follows:

Personal Protective Clothing. To prevent or minimize harm to the body, either by injury through accidents or because of various processes using chemicals or because of those items you have read from the 1939 list of cases classified as occupational, employees are furnished gratis a great variety of items such as hard hats, hair nets, plan and prescription goggles, respirators, rubber finger tips, tape, many, many types of gloves, etc. and in certain locations such as plating rooms—underwear, overalls, and wooden shoes.

In addition, safety shoes are made available to men at actual purchase price with no down payments, deductible from wages on a basis as low as $0.50 per week.

General Ventilation. General ventilation in each separate room is controlled by the appointment of one or more persons who act as monitors for this purpose, to see that proper temperature is maintained and that a continuous supply of fresh air is furnished.

Rest Periods. Rest periods, varying in time from 10 to 15 to 20 minutes, both in the forenoon and afternoon, are a regular routine in most all of the assembly and machine departments.

Mechanical Instead of Manual Operations. Constantly the engineering force is reducing or eliminating manual operations and substituting mechanical means, either through the use of air or electricity. Still requiring man power but reducing the manual effort.

Conveyor systems have eliminated many intermediate handling and lifting operations.

Electric and gas operated industrial trucks have replaced hundreds of hand trucks. Special lifting attachments on electrically operated trucks have also been a factor in reducing injuries, etc.

How Information is Received by the Safety and Health Department and How Contacts are Made on All Matters Pertaining to Safety and Health. Our set-up requires that all matters pertaining to health hazards shall clear through the safety and health department who contacts the engineering and medical departments. Copies of cases of those employees sent direct to the medical department are furnished to the safety and health department.

Health and safety suggestions from employees are also received and handled through the safety and health department to the units functionally responsible.

The safety and health department in general contacts the supervisors and employees through a number of means:

The Microphone—An eight sheet paper issued monthly, devoted to telephone business and general matters concerning Hawthorne.

The Accident Record—A four-page monthly leaflet dealing with matters of safety and health as concerns the supervisor.

The Safety and Health Record—A bi-monthly, 22-page booklet dealing solely with matters of safety and health as concerns the employee.

Then too, as occasion requires, memoranda on special subjects are also sent to all employees.

At times group meetings during regular hours or after hours are held with all supervisors.

In ending my "pinch hitting": From our viewpoint, as brought out by Mr. Moore, the large field is not injuries by accidents or in occupational cases but in the general field of sickness. And, within this field of sickness there may also be a real amount of unreal sickness. That too is another story.

Obviously if a company has no concern with reference to the general health of its employees, it has no problem—especially so if they pay for little or no absences caused by sickness. I believe, however, that more and more, year by year, industry

in general is taking an increasingly active interest.

As Mr. Moore stated this morning, Hawthorne is studying this general sickness situation. He outlined many of our methods of procedure and results obtained in individual cases of long term sickness.

In so far as short sickness absenteeism is concerned our records show that 50% of all cases are respiratory. That, too, is another story.

From the Viewpoint of:

Public Relations

Ralph L. Lee,
General Motors Corporation

"PUBLIC RELATIONS" has recently come into such general use and in for so many different interpretations, that it might be well on this occasion, at least, for all of us here to arrive at a common interpretation of public relations before we tackle the subject assigned me.

I believe that most of us at times have been surprised at the difference in the meaning of a word or phrase as we have been using it and the meaning which develops through a careful examination of it. It seems that the phrase "public relations" might well come within this category, for it is most frequently used to designate activities and devices designed to procure a more favorable public opinion than might ordinarily be developed through the natural course of events.

However, even a most casual examination of the phrase will disclose that public relations can hardly be twisted to mean anything other than "a relationship with — a condition — a situation or a status with the public" and by the widest stretch of the imagination can never be interpreted as an activity any more than condition of "health" can be confused with medicine, diet, physical exercise, fresh air or any of the activities and devices used for improving and maintaining health. So I suggest that we keep goodwill building activities and devices separate in our minds from public relations until we at least get into our subject.

Doing this, we begin to wonder why public relations is so frequently spoken of as new, for it becomes quite evident that every individual and every institution has always had and will always have a definite relationship with the public, whether it is recognized or not — either a good, bad or indifferent relationship depending upon the extent to which the public or some portion of it has benefitted, suffered, been bored or entertained as a result of the presence, conduct or activity of the individual or institution involved in that relationship.

Needless to say that in this present day when the interests and welfare of all individuals and institutions are so interdependently geared together in such a complicated and sensitive society — one in which individuals and groups can throw the whole out of adjustment — public relations takes on a new importance, in fact, to such a degree that no individual or institution can hope to prosper for long while ignoring his relationship with his particular public.

So, with this hurried exploration and definition of public relations, we might now approach the subject, A Company Health Program and Public Relations.

To begin with, I must confess that, while I am very much interested in industrial health and closely associated with those working in this field, I am not qualified to discuss the elements, techniques and details involved. However, regardless of this lack, it becomes quite evident to me that no business institution can possibly have a satisfactory relationship with its public if the health of its employees suffers as a result of the institution's essential manufacturing processes and occupations.

Before we had the data on occupational disease we now possess, company health programs might have been looked upon as debatable or to be engaged in purely on the basis of opinion, feeling or inclination of the employer. But now that we know such data does exist or the research techniques for securing it, and even more importantly, now that we know that the public knows we know company health programs designed to protect the employees from occupational disease are no longer debatable but come under the classification of business responsibilities equal in importance to those of producing a satisfactory product or keeping out of the red, protecting the health of employees endangered through occupation can no longer be confused with public goodwill building or public relations activites. I have heard of a number of cases when confusion on this important point was responsible for delaying much needed health programs which later turned out to be responsibilities instead of concessions.

So it appears that the occupational health phase of a company health program does not come under the category of public relations activities, in the most common use of the phrase, even though such a program might be extremely effective in correcting an unhealthy public relationship.

However, dismissing the occupational health phase of a company health program, we find an increasing recognition of the fact that in most industries more time is lost through non-industrial ailments than through occupational disease. This brings off-the-job health forcibly to our attention as employers, for it is perfectly obvious that lost time from any cause in a well organized and efficient business institution can be costly and wasteful to the company as well as the employees. There is little wonder then that business concerns all over the country are adding to their health programs provisions for more thorough pre-employment and periodic health examinations.

Even though we ignore any public relations value of such off-the-job health activities or humanitarian considerations, experience proves very definitely that such activities more than pay for

themselves in dollars and cents — in fact, larger profits than can ordinarily be expected from the business itself. So it would appear that no business concern, regardless of how small it is, can very well afford to neglect the general health of its employees as it affects lost time.

However, since the employees of any concern are also citizens of the community in which the plant is located and since public health has always been considered vital to the welfare of a community, an effective company health program, in addition to serving the interests of the company, also serves the interests of the community. If these activities can be carried on free of paternalism as far as employees are concerned and without conflict to the interests of the local medical profession, then such a company health program becomes a most effective means of gaining public goodwill and establishing a healthy relationship with the public.

In spite of the sad experience certain industrial concerns have had in the past with unintentional paternalism, I am told that employees who discover they have syphilis, diabetes, appendicitis, tuberculosis and other such chronic ailments through company pre-employment or periodic medical examinations are not resentful for any seeming intrusion into their personal affairs, but, to the contrary, are sincerely grateful for the service rendered them.

We also learn that the company physician who has clearly in mind the justification, objectives and limitations of the company health program he administers, is in a splendid position to serve the public relations interest of his company and also his own.

WITH a clearly defined line of demarcation between the medical jurisdiction of the company and that of the local medical profession, the company physician, in addition to serving the direct interests of his company and employees, can also assist the family physicians in their service to the employee group. For, through pre-employment and periodic medical examination, the existence of serious ailments or symptoms can be discovered and brought to the attention of the family physician, which would not likely be revealed through the natural course of events until some time later.

We need little imagination to see the splendid relationship most certain to develop between both the company doctor and the local medical profession as a result of such cooperation, and, inversely, we need hardly mention the harm that could be done, from a public relations standpoint, through a poorly planned and administered company health program.

It might be well for us to remind ourselves of the close relationship existing between the medical profession and the public, and the influence possible through that relationship — which brings us to the relationship the company doctor can have with the employee group.

Experience shows that, once the company doctor convinces the employee group that he is sincerely interested in their welfare, he frequently becomes their confidant and, as such, learns of their worries, disappointments, misunderstandings, grievances, family and financial difficulties which would not likely come to light through any other channel. In view of the importance of employee state of mind to organization effectiveness and employee relations, the company doctor, with an appreciation of the opportunity his position provides, can serve himself and his company as no other executive of the organization can serve.

Needless to say, a wholesome employee company relationship developed through an effective company health program can wield a tremendous community influence toward ideal public relations.

While in larger companies the company physician will find his hands full carrying out his program, the physician whose company duties permit him to continue his private practice will, I am told, find his company activities helpful to him, personally, through his contacts with employees, his professional associates and public health officials. So we find the part-time company physician benefitting, with his employer, in terms of public relations through a company health program.

OF COURSE, there is always the danger of overdoing any good activity. One thing leads to another, a program expands and, occasionally, before we appreciate it, we find ourselves straying from the original objective and out of practical proportion to it. While there appears no present danger of overdoing company health activities, it might be well for us, in our zeal for the cause, to keep continually before us that the first public relations responsibility of any business organization is that of providing the product or services for which it was organized and developed. And unless any activity engaged in by a business concern can be shown to contribute to the fufillment of that responsibility, that activity sooner or later becomes questionable.

Having been the head of a small manufacturing institution, I believe I can understand the viewpoint which may have existed in the past — that only large and unusually profitable industrial concerns could afford company health programs.

However, in view of our progress in the study of occupational disease, public recognition of industry's responsibility for protecting its employees from such disease, and in view of the proven cost to employers of off-the-job sickness, it would seem that even the smallest industrial concern cannot afford to do without a practical health program in keeping with its responsibilities, needs and opportunities.

In the little time we have had at our disposal, I believe we have shown that a company health program, as we have discussed it, will definitely contribute to the welfare of the institution conducting it, regardless of the size of that institution. And while even the best of such programs are far from complete, it might be well for us in the process of their completion to be guided by that line which separates public responsibility and eco-

nomic justification from means and devices for procuring a more favorable public opinion than would ordinarily come through the natural course of events — even though a company health program can accomplish much in the terms of public relations. So, as fas as I can see, a company health program and public relations go hand in hand — in fact, I am sure they belong together.

From the Viewpoint of:

Nursing

Joanna M. Johnson, R. N.,
Supervisor, Industrial Nursing Division,
Employers Mutual Liability Insurance Company of Wisconsin

IN THIS interesting period of development in public health involving expansion in state and national agencies, the industrial health program stands out as one deserving the utmost consideration, as it is the health and welfare of the wage earners we must consider if progress in public health is to keep pace.

The nurse in industry serves to build community health in no less a measure than does her sister nurse in other fields of public health nursing.

Our progress in this field today is based upon our experiences of the past. Let us go back to the year of 1895 and meet the first industrial nurse employed by the Vermont Marble Works. This trained nurse was employed to visit and care for the sick employees and their families. At that particular time, the management had become concerned with the amount of absenteeism, giving little thought, however, to industrial hazards in the quarries. The experiment of the Vermont Marble Works and its first trained nurse contributed to the education of employees and their families by instituting a modified physical examination program. She went further in her educational endeavors by bringing to their attention the value and importance of personal and community hygiene.

Two years later the Benefit Association of the John Wanamaker's Store in New York made use of the services of a trained nurse, Miss Anna Duncan; she originally was supposed to visit only sick members, but by her initiative and ingenuity succeeded in developing a real nursing and educational service for the employees and management, comparable in a measure to industrial nursing as we know it today.

The Loeser Department Store, Brooklyn, New York, in 1899, engaged a nurse. In 1897, England inaugurated industrial nursing in the Cadbury Chocolate Company in London. This is of interest to all of us because it distinctly points out that, in two English-speaking nations, interest in health matters had begun to take root. From these beginnings industrial nursing demonstrated its value, and has been the basis for many a modern medical department. However, we have to admit that many employers in their zeal and enthusiasm to help their employees were not always well informed about the employment of a well-qualified nurse so that practical nurses and undergraduate nurses stepped into these positions and, limited as they were in the knowledge of these problems, carried on a first aid job only, instead of developing the broader field which we now interpret as industrial nursing.

At the outbreak of the world war, industrial nursing had its first great expansion. This was a natural development since men and women in increasing thousands were working in plants, and national demands made full production necessary to meet war orders. This expansion of industrial nursing, therefore, is of prime importance because it led management to realize the importance of medical and nursing services to keep their employees on the job.

During the depression years which followed, all of you remember only too vividly the beginning of unemployment—thousands of steel mills and factories working part time, others closed entirely. In those plants which kept running, the personnel was reduced. In spite of the depression years, however, many industries which had well established medical departments, merely curtailed some of their services. Far-sighted physicians and nurses who had created an important service in industry were kept, regardless of depressions.

Let us review some of the factors which promoted the expansion of nursing service in industry.

The workmen's compensation laws, the first of which was passed in Wisconsin in 1911, provided great impetus or stimulus in the development of safety and health measures. These laws, nationwide, have continued to be the greatest stimulant to the safety program and to the maintenance of health in industry. All but one of the 48 states now have such a law.

The National Safety Council was also organized about that time. The National Organization for Public Health Nursing was organized in 1912 for the purpose of developing and stimulating public health nursing. In 1925 this organization held its first meeting especially for nurses in industry. For 15 years this group has continued to foster programs, in connection with the National Safety Council, which are of great importance to the industrial nurse because the objectives of the two organizations in the field of safety are so closely interallied. In 1920 the Industrial Nursing Section of the National Organization of Public Health Nursing was formed primarily to aid the nurse in industry who because of her isolation and lack of supervision so frequently found herself inarticulate as to the importance of her service. Lack of supervision then must be compensated for by available contacts with other public health nursing groups which are increasing because of the growth of public health education.

AT PRESENT our chief concern in regard to nursing service in industry does not lie with the large industries in which medical service is well established, but rather with the thousands of

smaller plants to whom the problems of health and safety seem a thing apart from production. Here it is we must direct our efforts. With the vast amount of information available, why can't we give to these smaller plants as well, the benefit of the achievements obtained from well-directed efforts? We can. Why not combine forces, at least in part, with some or all of the organizations available who are anxious to serve in this field of life's preservation. For your attention, I shall list some of these available organizations:

1. Industrial Health Council of the American Medical Association.
2. American Association of Industrial Physicians and Surgeons.
3. State and Local Health Departments.
4. Insurance Companies.
5. Industrial Commissions.
6. Industrial Hygiene Bureaus of State Health Departments.
7. National Organization for Public Health Nursing.
8. National Association of Manufacturers.
9. National Safety Council.
10. United States Department of Labor.
11. Visiting Nurse Societies.
12. United States Public Health Service.

Any or all of these are available, in part at least, in every community of this country.

Plans are under way, in many communities, to encourage visiting nurse associations to carry on a part time nursing service in industry. This plan has many advantages—leadership and supervision being most important.

Dr. R. D. Mudd, Chairman of the Industrial Health Council, Saginaw, Michigan, is now working with the Visiting Nurse Association of that community on this plan. Many others will follow. A report and suggestions on visiting nurse contacts with industry are available through the National Organization of Public Health Nursing. Promotion of these plans is timely, with a special thought to the national defense program, in which the nurse serves as a strong adjunct for the promotion of health and safety.

With the growing demand for well qualified nurses, I should like to discuss briefly the value of the preparation for the field of industrial nursing. You have in mind the qualifications essential to the success of any nurse. With the social and economic problems that are confronting everyone, it would seem logical that we professional workers equip ourselves with the best knowledge possible for our positions. Before accepting placements, we should acquire experience in the public health agencies which emphasize the family health service. We should develop skill in working with families and wage earners, to learn how to utilize community resources, and we should supplement this experience with further study.

The nurse in industry should familiarize herself also with the proper procedure in all emergencies. This is especially essential. A Red Cross first aid course is a valuable asset, and all colleges offering programs of study in public health nursing should include this subject in their curriculum. Also, schools of nursing should give courses in first aid to undergraduate nurses.

It would seem to me that all universities which are now conducting public health nursing courses could assist in developing further special courses for the nurse in industrial hygiene. Several of the universities are doing this—University of Michigan, University of California, Marquette University, and Loyola. No doubt, a number of others have plans under way at this time. There should be standardization of these courses, the planning of which should come, for the most part, from the medical and nursing professions, with assistance also from the field of engineering. I believe all universities would welcome this suggestion and join in these programs. We should go even further in preparation of the industrial nurse of tomorrow. We must look to nursing education to introduce the undergraduate nurse to the various fields where she can better supplement her basic education before entering a special field. There is a great need for leadership in nursing education.

At this point, I shall stress the necessity for the proper professional qualifications of the industrial nurse for her job in the field of community health. I shall not list the qualifications here. They may be secured from the National Organization of Public Health Nursing, or the National Association of Manufacturers. They have also been reprinted in the *American Journal of Public Health*, the *American Journal of Nursing*, and *Industrial Medicine*, as well as *Public Health Nursing*.

I NEED not list here the duties of the nurse in industry. So much depends upon the plant set-up, whether there is part or full-time medical supervision, or perhaps merely a panel of physicians. Needless to say, here the nurse works under the direction of standing orders which have been set up by the physician responsible for the medical service in that industry. Thus far, the Wisconsin State Medical Society is the only medical society, to my knowledge, which has developed standing orders to be used as a guide to the industrial nurse. These general standing orders do not, however, take the place of specific standing orders of the physician who is actually servicing that plant.

The nurse's program in the plant varies also according to the size of the industry, the hazards involved, geographical location, and the product manufactured. The administrative set-up in the plant, and its relation to management will also determine her program. Regardless of the form of organization under which she is working, the success of the Nursing and Health program depends upon her ability to correlate it properly with other departments of the plant.

In closing I leave with you the keynote used by the Department of Labor and Industry of the Commonwealth of Pennsylvania: "Uncontrolled occupational diseases, like uncontrolled accident hazards, are a costly and needless by-product of industry." To this I add, they are not only a costly by-product of industry but are needless wasters of

human lives, costing individuals and families much needless suffering.

This presents a challenge to all of us engaged in this great field of life preservation. We cannot fail to meet this challenge.

From the Viewpoint of:

Research

LeRoy U. Gardner, M.D.,
Director, Saranac Laboratory,
Saranac Lake, New York

I ASSUME the subject which has been suggested for me to discuss of research in the industrial health program involves not only laboratory research, but the broader field of all methods used to point out industrial hazards to health and to define their nature and their scope. By using these various methods in an expansive study of the workmen and their environment, it has been possible to accomplish the progress that has been made in the past years.

We have to use, as I have indicated, a great variety of methods. The mass survey technique has pointed out the prevalence of industrial disease throughout industries in the country. Repeated periodic surveys have established the course of these various conditions and enabled us to anticipate what the outcome of pathological conditions might be. Clinical investigation, using not only the ordinary methods of physical diagnosis, but those of the x-ray, chemical, bacteriological, laboratory, and other adjuncts have defined the modality of these diseases, established the characteristic signs, clarified methods of diagnosis and have helped us to evaluate disability. Postmortem examination of the pathologist and the clinician as well are invaluable.

It is only with the opportunity to examine the pathological tissues that we can become accurate in the method of diagnosis. Unfortunately, there has been a dearth of such materials to enable us to establish some of the things that we really need. However, we have been able to supplement this lack of information to a certain degree by the use of experimental methods. With experimental animals, we have been able to understand pathological processes. We have been able to build up the pictures of characteristic pathological changes. Furthermore, the experimental method has enabled us to isolate and to study under conditions of control, the effect of various environmental factors.

Finally, we have had the intensive physical study of environmental conditions both in plants and under laboratory conditions, which have given us the background and helped us to define many of the hazards; helped us to set up zones of safety and limits of tolerance in various substances.

Correlation of the data obtained by this last method of investigation with all the other methods employed to study the effects upon the workman himself, have brought up certain accomplishments. Many of them are entirely familiar to you, and I am not going to take your time by listing more than a few of them. From dust, we have, of course, come to understand the effects of free silica and asbestos. It has been possible to eliminate many of the noxious dusts.

From fumes and gases, we know more about the effects of welding fumes and gases, particularly carbon monoxide, tetraethyl lead, and oxide of nitrogen. They are all pretty well known and understood. The poisons, like chromium, mercury, benzol, aniline, carbon tetrachloride, trichlorethylene and many more are appreciated. As to skin irritants, we know there are a great variety of substances which produce dermatitis — some of them in all individuals; others only in sensitive ones. We are learning a great deal about their effects, but more has yet to be learned.

But, there are other problems that are not yet solved, and they constitute a challenge not only to medicine, but to engineering and to industrial management. Probably they will constitute a challenge for a good many years to come. I could mention among those that are most pressing and most in need of solution in the fields of industry, for example, the necessity for more physiological research on the nature of the disability produced by silicosis and perhaps the necessity for better objective methods for measuring disability.

I think we could possibly learn a good deal more about the variations of individuals and their capacity to respond to dust. We know that not all men who are exposed to what seems to be equivalent industrial concentrations of dust react in the same way. If it were possible to discover in advance the individuals who were more susceptible to dust than others, such individuals might be placed in positions where they would not suffer disability. The laboratory is now engaged in the study of this problem, and in Pittsburgh yesterday I outlined the progress of those studies.

ONE of the most pressing problems is an evaluation of effects which we are seeking in our mass survey of large groups of industrial workers. There is a very common tendency to ascribe abnormal shadows which may be found in such films to environmental factors in the working place. It is not necessarily true that these shadows may be caused by environmental factors nor is it necessarily true that such changes as seen in the x-ray film are the cause of disability. We need a real critical analysis of the lungs of human beings who have died after employment in such industries. We need to know whether these changes in the case of alleged dust exposure are due to dust predominating in the industrial process or whether they are due to contaminating silica; whether they may be due to associated effects. Experimental studies are helping us here.

There is opportunity for more intensive study of the effects of some of the unknown dusts and their combinations. Unless we have such information, accurate diagnosis becomes difficult

and it is impossible to evaluate the influence of these factors.

We are still progressing with our investigations of the influence of inhibitory substances acting along with quartz and with asbestos dust. We know that some of them modify the effects of these known irritants, often preventing reactions from occurring with their ordinary severity; in a few instances, possibly, accelerating their effects, though there is some doubt whether this occurs.

In addition to this subject of tuberculosis in industry, I think there is very real need for a critical assay of the various factors which are alleged to have given rise to tuberculosis. We all speak very glibly of the effects of these factors, but many times we speak with little actual knowledge. We would like to know whether any or what particular factors in industrial environment are responsible for reactivating pre-existing infections, whether any of these industrial factors predispose the lungs to new infections. We hear a great deal about the actions of respiratory irritants exerting such effect, but as a matter of fact the experience with gas during the last war seemed to prove pretty definitely that men who had been exposed to excessive concentrations of gas far exceeding those ever encountered in industry did not have any more tuberculosis probably than the general population.

This same, of course, is true in the case of toxic fumes. We have all of us heard of lead tuberculosis developing from exposure to lead, carbon monoxide, and organic dust of various kinds, but there is no definite proof that this is the case. I think most of the evidence opposes rather than affirms such a belief.

Humidity is alleged to be responsible for more tuberculosis in laundry workers than in other occupations. The proof yet remains to be produced. The same might apply to other factors like changes in temperature, fatigue, posture, and so on. We could classify many more of them.

Then, we come to the question of pneumonia and again, we lack definite information. We are more and more coming to believe, I think, that changes in temperature may have much more effect than in relation to dust. Probably, we can exclude dust as the cost of most cases of lobar pneumonia. Whether the same is true for bronchial pneumonia, I am not absolutely sure.

Another problem which will continue to occupy us in the research field for a long time to come is the assaying of new reagents and synthetic compounds as they are being produced. The industrial hygienist will always be busy in this field.

Finally, it becomes our duty as research investigators and as teachers to make available the knowledge that is coming out of the laboratories, coming out of the industrial plants to the medical profession at large, so that they may apply their information more accurately in the diagnosis of diseases. In the small plant which has been mentioned so frequently here today, probably management will have a part in the program of research, but it does mean real research to make available to him the information that is already at hand. If we can teach the local doctor, as has been suggested here today, to become familiar with industrial operations in the plants in his vicinity; if he can know something about industrial disease in general, he will become more effective. It seems to me if this is not done, the only alternative is some form of public supervision for the small plant.

From the Viewpoint of:

Industrial Psychiatry

LYDIA G. GIBERSON, M.D.,
Metropolitan Life Insurance Company, New York

MY TOPIC differs somewhat from those which have already been presented in that much of the basic material involved must still be conjectural. For you will understand that industrial psychiatry, as such, has barely reached a beginning in the United States. And, in this retarded development, only the simplest explanations of principles and the simplest of projected plans can have a "practical value" and an "application."

I use the word "retarded" with full recognition of its value. We have been backward in this country with regard to the application of the new psychiatric findings. Other countries long ago outdistanced us. England, France, Germany, Norway, Sweden, and even Russia and Italy have had planned programs of industrially applied psychiatry in which the mental and emotional maladjustments of employees have been studied and treated in the interests of greater efficiency. We, in the United States, have made no such efforts. In fact, as I can personally attest through considerable campaigning, we not only lack such programs, but even the basic educational work preliminary to them has not yet been done. If industrial psychiatry by theory and example has shown its desirability in other countries, it ought to have something to offer this country. Our problems in handling human beings are much the same as theirs, and yet, with the exception of two programs not properly classifiable as industrial, we have not taken advantage of this fruitful aid to industrial efficiency.

My discussion, then, will cover only a few of the basic considerations, and I will do my best to keep within the limiting words of this conference, "practical value" and "application." As a matter of precaution, however, let me define my terms.

INDUSTRIAL psychiatry, as I see it, is a phase of preventive medicine. It aims to forestall and prevent serious mental and emotional maladjustments among industrial employees. It is an attempt to bring the benefits of modern psychiatry and modern neurology to the broad mass of work-

ing Americans now excluded from those benefits. It justifies its bid for a place in American industry not only by the humane factors involved, but also by cold hard gains in efficiency, morale, and profits.

Now consider those key words of our conference, "practical value" and "application." Practicality is certainly a characteristic of the United States; from Franklin to Edison our slogan has been "make it work"! We are a pragmatic lot; our dreams and our blueprints must be turned into actualities before we can respect them, or, deep down inside of us, even believe that they can or do exist. A practical machine and a practical program is one which works and works efficiently to produce a desirable product. Furthermore, that machine and that program cannot cost too much to build, and its building should not constitute a threat to the bulk of currently operating machines and programs. And the term "application" I take to mean the method and manner of putting a practical program into effect without dislocating the existing framework.

I accept the limitations of these terms. If practical value means the effecting of savings in time, money, morale, and efficiency, then the word applies to a program of industrial psychiatry which will lessen the costs caused by accidents, absenteeism, employee maladjustments, and labor turnover.

In the matter of industrial accidents, let me refresh your minds with some of the estimated totals. For the year 1936, the National Safety Council gave as a total, 1,548,000 occupational injuries resulting in 18,000 deaths, 70,000 cases of permanent disability, and 1,460,000 cases of temporary disability. As estimated cost of these accidents the figure offered was $660,000,000, of which $510,000,000 was assigned to wage loss, $40,000,000 to medical expenses, and $110,000,000 to overhead cost of insurance. From another source published this year, the expectancy in fatal accidents for 1940 was stated as 15,000 to 25,000 with a similar number of cases involving permanent and total disability; of disabling but less serious accidents there will be probably between 2,000,000 and 3,000,000 in the United States this year. Another way of stating the situation is this: that for every working day there are 10,000 workingmen being injured in American industry. These estimates, considering the lack of uniformity in legal and statistical procedures, are, if anything, understatements.

To these general figures let me add some observations pertinent to my specialty:

First: Very nearly 90% of industrial accidents are caused by emotional factors. Of this 90% some 50% may possibly be avoided through preventive medical action.

Second: The industrial accident rate in the United States is still about twice as high as that of Great Britain, France, or Germany, according to the best pre-wartime figures from these countries. True enough, our accident rate has been reduced 77% in the last 30 years, but the high rates as contrasted with those of Europe show how much remains to be done. You will remember that the three countries mentioned have had large scale applications of industrial psychiatry.

Third: A surprising number of accident victims are repeaters. They are the accident-prone employees who seem to create their own hazards. In a recent study of accidents among Home Office employees of our company for a two and a half year period, less than 2% of the employees were responsible for 30% of the accidents, and in a personal review of these accident cases I found that 16% of the repeaters had been referred to me for medical reasons. Again, in a study of 5000 automobile drivers in Connecticut, 6% of the drivers contributed 72% of the accidents. It seems logical to assume the presence of either an accident frame of mind or an accident type of personality. A psychiatrist, given a chance, might reasonably hope to isolate these repeaters.

Fourth: Near accidents and narrow escapes are not generally reported. Yet the emotional shock and damage in these instances are almost as great as though the accident had occurred. Severe emotional shock, unless treated, brings loss of time, skill, and efficiency. Not infrequently it leaves a predisposition to accident and may even develop into an anxiety neurosis.

Fifth: Accident frequency rises in direct proportion to the employment index. For this there are many reasons, among them the use of marginal help, breaking-in periods for beginners, and the increased tempo of production. Ahead of us for the next few years is a sharply rising employment index due to the national defense preparation and the possibility of actual war. Inevitably there will be higher and higher accident frequencies.

From all these points I make a simple deduction. I propose that an efficiently applied program of industrial psychiatry has the very real possibility of reducing accidents and their costs some 15 to 40%.

In addition to this saving through accident prevention, a psychiatric program would have considerable application in effecting a lessening of the costs of absenteeism and labor turnover. Both of these are serious problems in factory management because they involve heavy additional expense. Absenteeism forces the management into a Hobson's choice of bearing the overhead cost of idle machinery or of bearing the constant upkeep cost of understudies held in reserve; and to either of these must be added the factors of increased accident rate, greater spoilage of materials, greater damage to machinery through inexperienced handling, and in general, a slowing down of the production rate. In labor turnover, itself, the cost per case will run, I am told, somewhere between $50 and $200, depending upon the type of work and the length of the training period.

Yet both of these costs can be reduced because many cases of absenteeism and turnover are avoidable. Here are some representative figures. Ac-

cording to the United States Labor Bureau total absences in United States industries will vary from 4% to 18% of the working days in the year. The probable figure, adjusted for modern, efficiently run plants might come between 6% and 10% on the average, with 8% as a workable generalization. Of this 8% some 2% are accident absences; an additional 2% of absences are unavoidable because of sickness or non-industrial accident. There remains, then, an approximate 4% of the working days which can be considered as avoidable time lost. Now the reasons for these avoidable absences are most often emotional in origin, arising from some maladjustment of the worker with his job. Since an efficiently applied psychiatric program would deal with just these maladjustments, it is not unreasonable to expect that it would reduce this percentage of the working days lost from 4% to 2½% or even lower.

In regard to labor turnover, I believe that a psychiatrist would be the first to admit that some of it is not only necessary but even desirable; new blood and a change are marvelous tonics. Yet, in the cases of voluntary separation where the cause is an emotional maladjustment, psychiatric investigation can often heal the breach and keep the worker on his job. And, may I remind you in passing that sick men do strange things, and very often get fired for doing them? I have seen many employees who, in a few moments of emotional ill-health have kicked over their records of 10 and 15 years of satisfactory service; they were temporarily sick people and their actions should have been blamed on their sickness and not on them. Not always was that done. No doubt you will remember a few instances yourselves.

So, in accident prevention, and in lessening the costs of absenteeism and labor turnover, a psychiatric program would have considerable value. But it is in the improvement of employee morale, promotion standards, and worker efficiency that a psychiatric program would make its most valuable contribution, for in these matters its full preventive power would take effect. I wish it were possible to give you general figures for the extent of such prevention. Unfortunately, the factors of morale, good-will, resistance to emotional strain, reciprocal fair-play, mental and emotional health, etc., are not amenable to direct measurement, though the varying degree of their intensity can be felt by any trained personnel worker. Perhaps the best way to present this portion of psychiatric work is by concrete example, that is, by figures taken from a psychiatric program in action.

OUR company has had a psychiatric program in force among its Home Office employees for the past 17 years. The program there has operated upon three levels, first, the immediate first aid treatment given to mental and emotional breakdowns among the employees, these being considered as definitely medical cases; second, the reported instances of personality clashes, disaffections, inexplainable losses of efficiency, excessive fatigue, accident repeating, and avoidable absenteeism, these instances being termed preventive interviews; third, general consulting service in matters of promotions, transfers, and general employee mental health. Records have been kept for the first two of these levels. The 17-year total of strictly medical cases comes to 4,135. These averaged 243 new cases each year, with the average for the last seven years reaching 262 due to increased number of total workers employed. These medical cases kept to a consistent percentage for each year, something just slightly less than 2% of the total employed body. (Actually 1.94%.) Prevention interviews totaled 42,787 for the 17-year period with a constantly rising frequency per year. Interviews in 1930 were 1,586 and in 1939 they were 4,895. Thus, while the percentage of medical cases remained fairly constant, the interviews due possibly to wider acceptance and smoother working of the program, have increased some 300% since 1930 until now they will average 4,800 per year, out of an employed personnel of 14,500.

If one were permitted to generalize upon the findings of this single application of industrial psychiatry, would it be possible to secure an index percentage which would indicate the amount of immediate psychiatric work to be done in the average industrial plant about to institute such a program? I would like to try. Suppose for an employed body of 13,500 we take a five-year period as the interval during which the employees affected could, on the average, be considered permanently employed. Then in the last five years of the average plant, 9.7% of the total employees should have received direct psychiatric treatment, that is, direct medical treatment, and 3% of these cases should have been classified as total disability. In the matter of preventive interviews, allowing five interviews to the case, there would have been 960 employees seen per year, or a five-year total of 4,800. With a duplication factor of three, (that is, the same person or situation requiring attention three times in five years) there would have been 1600 preventive instances in five years. With a personnel of 13,500 this comes to 11.85% of the employed body treated with preventive measures. If one allows merely 20% accumulation of cases in an industry which has not yet put in a psychiatric service, and if one deducts 3% of the medical cases as unfit for work, then the grand total would be 25.5% of the total employed body, or one worker out of every four whose efficiency and morale would be distinctly improved by psychiatric attention.

All these figures, of course, are merely indications and not exactitudes. They apply to a single example of industrial application, and a mainly clerical one at that. They can be applied only gingerly to heavy industry, though, for that matter, the estimates I have given represent most probably the amount of work a single, full-time psychiatrist can do, rather than the amount of work to be done. In all probability there are complications which have not yet arisen, and certainly there are methods and advantages which have not

yet been tapped. We shall know a great deal more about industrial psychiatry one of these days. Large scale applications are bound to come and then we can be more exact.

Right now, though, the method of any further application is still conjectural. I feel that any future program should be an advisory one; that is, the program, while adhering to the most rigid standards of medical integrity, and while demanding full medical immunity for its personal files, should furnish estimates and recommendations concerning specific workers and worker situations. So working within the present medical set-up, the psychiatric program would bring a new dimension to the understanding of employee problems, but the psychiatrist (except in outright medical cases demanding prompt action) would leave the use of the new findings to the executive and personnel departments. To be effective at all, however, either in the interests of management or of those of the employee, such a program must be emphatically neutral and strictly medical. It must guard jealously its "zone of neutrality." By the confidential nature of its findings, by the scientific neutrality of its procedures, and by the broad pertinency of its application, industrial psychiatry must follow a path parallel to, but not completely identified with other aspects of industrial work. I see for it no independent existence aloof from industrial procedures. Psychiatry can wear overalls too. But its job will be to find facts in the difficult realm of human emotions, and to do this well it must have the detachment and singleness of purpose of a mathematical analysis.

More directly, the application of industrial psychiatry might follow either of two continental patterns: The resident psychiatrist, as in most of the programs in English factories, or the regional psychiatric center servicing an industrial area as in Germany. Our selection of either may come through abstract analysis or through concrete experience. At this moment it is difficult to tell which.

The first world war brought about the first application of mass psychiatry in this country. Will the shadow of the second world war clarify our industrial viewpoint? Will we accept this aid as a definite part of a preventive industrial health programme. Ladies and gentlemen—the answer is in your hands.

Industrial Health and the National Defense

Paul A. Neal, Surgeon,
Chief, Division of Industrial Hygiene
National Institute of Health

ONE of the outstanding developments of the present national defense program has been the recognition on the part of the leaders of our nation that health is an essential element of preparedness. On September 19, 1940, the President approved an order establishing a Health and Medical Committee to advise the Council on National Defense, and to coordinate medical and health activities affecting national defense. This Committee consists of the following members: Dr. Irving Abell, Chairman, the Surgeon-General of the Army, the Surgeon-General of the Navy, the Surgeon-General of the Public Health Service, and the Chairman of the Division of Medical Sciences of the National Research Council. This Committee and its many subcommittees have the responsibility of advising the Council on National Defense regarding the health and medical aspects of national defense, and of coordinating health and medical activities affecting national defense. One of the important subcommittees set up by the Health and Medical Committee of the Council on National Defense is the one on industrial health and medicine. Dr. Clarence Selby is chairman of this subcommittee.

Industrial Health Problems

IT IS now a well established fact that military mobilization and expansion is impossible without industrial mobilization and expansion. The present industrial expansion has already brought in its wake many new problems in employee health. To insure maximum physical fitness, the industrial worker needs to develop a high sense of personal responsibility. Industry must continue and accelerate its efforts to protect and promote physical welfare among workers, and the various health agencies, both governmental and private, must give every possible assistance through scientific research, through the expansion of community sanitation measures, and through the application of our developments in both the prevention and treatment of disease.

Despite continued progress in the field of industrial hygiene, we still have in this country 17,000 occupational deaths from accidents every year; 75,000 permanent disabilities; and 1,400,000 temporary disabilities. Recent surveys conducted in industry show that the working environment of about one million persons requires investigation by trained industrial hygienists to determine whether or not the presence of silica dust in the air constitutes a health hazard. The conditions of work of 800,000 persons handling lead and its compounds also need study. Similar information is available on many other potentially hazardous exposures. For example, it is well known that many millions of workers are exposed to materials which, if improperly used, are capable of causing skin diseases. Furthermore, it is well known that industrial workers have higher rates of physical defects than non-industrial workers and that the death rate from all causes among unskilled workers is 100% or more in excess of the death rate among agricultural employees. The many studies of illness among workers recently completed show that the average worker in this country loses 10 days a year on account of sickness. In fact general illnesses have been found to account for 15 times as much lost time as that due to both accidents and

occupational diseases. This problem of lost time from disability among workers is of vital importance now that our industrial machine is playing such a prominent role in the defense effort.

Our recent studies have also shown clearly that although industry is cognizant of the problem and is making progress, much still remains to be done. For example, only 25% of our workers have full time safety direction services, only 15% have full time medical services, and only 33% have nursing services. Engineering studies have also brought out the fact that protection against exposures to hazardous materials and conditions is still far from adequate.

The present industrial activity on defense orders has already augmented these problems in industrial hygiene. Able bodied men are being mobilized into our armed forces and these will have to be replaced in industry by older men, by young adults, and, in some cases, by women. Many of these newly inducted industrial workers will not be as physically fit for arduous tasks, nor will they be as skilled. The problem of fatigue, so important in the first world war, will again reappear as the result of the rapid tempo of industrial production. Many hazardous chemicals, both old and new, will be introduced into industry. We may expect crowding in factories and we must fight the tendency to relax in the vigilance so necessary to prevent accidents and diseases among workers. Dr. Parran has stated that our industrial machines are rated to be the most efficient in the world, and he rightfully insists that the men and women who operate these machines should have a comparable efficiency.

These, in brief, are some of the industrial health problems facing us today in our preparedness program.

However, the groundwork laid by research during the past quarter century and the machinery developed during the past several years for the application of this research by the States and by industry finds us better prepared to cope with industrial health problems than at any time in our industrial history. *We know that every job can be done safely if we only apply our present knowledge.*

The Program

FORTUNATELY, the industrial hygiene program could be launched immediately, in view of the fact that the various States in organizing their industrial hygiene services had already made detailed surveys of the problems in each locality. The States are therefore in a position to know where these services are needed. Furthermore, many of the research activities of the Division of Industrial Hygiene, which are carried out during peace times, furnish us with the key to the solution of problems of a military nature and some of our findings can also be applied to emergency problems in industry. For example, the study this Division recently completed on the fatigue status of truck drivers has furnished us with a great deal of information applicable to fatigue problems which may arise in industry as a result of increased activities.

The industrial health and medical subcommittee established by the Health and Medical Committee of the Council on National Defense has already been assured the fullest cooperation of the Industrial Hygiene Division of the National Institute of Health. All of the facilities of this Division will be put at the disposal of the committee, and a greatly expanded employee health program is being developed in close collaboration with the 31 State industrial hygiene units, with industry, labor, and numerous official and unofficial agencies. In other words, a program has been developed for coordinating the work of all the Federal and local agencies, of industry, of labor, of the medical and engineering professions, and of all organizations vitally concerned with industrial health.

In so far as the Division of Industrial Hygene of the National Institute of Health is concerned, its functions may be considered as partly administrative, concerned with coordinating all activities both at the Federal and State level, and mostly concerned with the promotion of industrial hygiene services in State and local health departments, and with scientific investigations conducted both at its laboratories and in the field. The Division of Industrial Hygiene is already carrying out urgent research directly related with defense and it is working very closely with both the Army and the Navy. In addition to fundamental laboratory research on toxic materials of direct importance to national defense, some of the Division personnel are being employed to supplement the work of these States which have been confronted with emergency problems too great for successful handling by their own efforts. If the necessary funds for this phase of the work are obtained, it is planned to have at least 15 units in the field, each consisting of a trained physician, an engineer and technical support, for the purpose of assisting the State industrial hygene units on emergency problems. Several such units are already doing work with the States.

In brief, the work which the Industrial Hygiene Division is already performing, and which it hopes to expand, may be summarized as follows:

1. Industrial hygiene services to government arsenals and other Federal projects.
2. Assistance to the States on industrial hygiene problems in defense industries.
3. Toxicological research on defense materials.
4. An appraisal of the fatigue status in relationship to the national defense program.
5. The determination of methods for the absorption of handicapped persons into vital industries for national defense.
6. The preparation and dissemination of information on various toxic materials and processes, including approved designs of exhaust systems for control and elimination of atmospheric contaminants.

Practically all of the States having industrial hygiene divisions have already submitted programs to the Public Health Service for assisting industry

in maintaining healthful working conditions and healthy workers. These programs differ in no way from those already practiced by the States in the past, except that emphasis will be given to directing their efforts to industries engaged on defense contracts. In other words, the work in the States will embrace the following activities:

1. The evaluation and control of the various health hazards arising from exposure to dusts, fumes, gases, and vapors.
2. Advice to industry in the construction of new plants and in the renovation of old plants in the interest of safety and health.
3. The promotion of physical examinations and medical services to workers by industry.
4. The promotion of measures for the control of communicable disease, such as syphilis, pneumonia, tuberculosis, and others.
5. The preparation and dissemination of information on various toxic materials and processes, including approved designs of exhaust systems for the control and elimination of atmospheric contaminants.

Industry is thoroughly convinced of the fact that it pays to control accidents. In reducing the frequency, severity and monetary losses involved in industrial accidents industry attacked the problem from two viewpoints: First, by the provision of well guarded equipment, and, second, by the education of workers in safety measures and practices. We are thoroughly convinced that the same tactics will materiallly aid in reducing lost time from occupational diseases and other illnesses. In other words, first, we must provide a safe and healthful environment, and second, we must educate the worker in safe practices and healthful living.

It is quite evident that in so far as public health and medical preparedness is concerned, plans have been created which are not emergency improvisations, but are designed to be an integral part of our national life in the future. This is especially true of our industrial hygiene program, and it is hoped that we will not forfeit the gains we have made so far for the sake of expediency. All of us, be we public health workers, private medical practitioners, engineers, chemists, industrial managers, or factory workers, must assume leadership and responsibility and coordinate all of our efforts, so that the men and women in our industries will attain a high level of efficiency and health.

Industrial Health and the General Practitioner

Morris Fishbein, M.D.,
Editor, Journal American Medical Association and Hygeia, the Health Magazine

As our nation mobilizes for preparedness, the problem of the health of the worker looms larger than ever before in our country. Already the great nations of Europe have discovered that the winning of any war that cannot be won in a single brief spurt is a matter of men, morale and nutrition. In Great Britain a special board known as the Industrial Health Research Board of the British Medical Research Council has just made a report in which they point out that misguided efforts to stimulate workers to feverish activity in the supposed interest of output are as useless as would be the cheers of partisans encouraging a long-distance runner to a futile sprint early in the race. In the United States we are no doubt as well prepared industrially from the point of view of health as is any other nation in the world.

Yet even in this country it is already apparent that the number of industrial physicians available for a rapidly expanding industry is far below our requirements.

As a part of its effort for the national defense, the American Medical Association has sent a questionnaire to every physician in the country to determine his availabilities for military or other services. More than 175,000 physicians have been queried and more than 120,000 replies are already at hand. It is apparent from the replies that have been received that there are probably less than 5,000 physicians in the entire United States who can qualify as especially competent in the field of industrial medicine. Moreover, a second questionnaire was sent to 3,544 persons who indicated special competence in industrial medicine. At once 495 replied to the effect that they were not industrial physicians. Only 1,283 physicians especially qualified in industrial medicine could be recorded as actually competent in the field.

Industrial medicine has been defined as the application of the principles of preventive medicine to groups of individuals who are employed in various ramifications of industry. The health and medical problems of the industries which have grown in our country with the advancement of modern invention and technology are innumerable and exceedingly varied. They involve problems of chemistry, toxicology, sanitation, hygiene, accident prevention, and many other special fields in some of which decision today is almost impossible simply because of a lack of fundamental information necessary for solution. Indeed the need of basic research in the health problems of industry becomes immediately apparent whenever any aspect of this subject is given consideration.

Today the place of the physician in our industry is not yet fully defined. In some factories a first aid kit is the sole provision for medical aid to workers. In other plants of the same size there may be a completely equipped dispensary with several beds, a full time physician and a nurse. In one industry a young man, scarcely out of the swaddling clothes of an internship, is the sole source of information. In another plant there is not only a physician of long experience but also a staff of specialists capable of handling any emergency.

The amount of service undertaken by industrial physicians varies again with different plants. The industrial physician differs from the average phy-

sician primarily by the special knowledge that he possesses in the industry with which he is concerned.

He holds a special responsibility to both his employer and the worker. He holds likewise a special responsibility to other physicians in his community. As a physician he must recognize that the patient's interest is primary. As an industrial physician he must recognize the necessity of serving his employer without prejudice. Almost invariably the industrial physician is considered to be the representative of the employer. Industrial medicine will not, however, assume its proper place in industry until the industrial physician is recognized to be a professional man with the same ethics and the same ideals that concern physicians in every other branch of medicine.

THE Council on Industrial Health of the American Medical Association has been inclined to the view that the private physician, the physician in industry and the public health administrator are jointly responsible for the proper development of industrial health services. This is a recognition of the fact that the worker spends only a portion of each day in the plant itself, and that he is, therefore, subject to the ministrations of the plant physician only as a part of his health protection. As a citizen of the community he is equally amenable to the control that comes through public health administrators. In this connection Dr. Clarence D. Selby has pointed out that the right of the workman to consult his personal physician when suffering with ordinary sicknesses and injuries not related to his occupation or indeed for verification in matters of doubt concerning industrial health matters makes the local practicing physician an essential element in every health service program. The modern industrial physician is thus in no instance a competitor of the general practitioner in the community. He recognizes, indeed, that he must have the cooperation of such practitioners who serve efficiently to find cases in their earliest stages which might otherwise never come to the attention of the industrial physician. On the other hand, the worker who comes to the industrial physician with a condition which is in no sense related to the industry in which he is employed may be directed at the earliest possible moment to his family physician for the care of the condition which might otherwise go many months without correction.

The statistics of modern industry indicate that ordinary sicknesses and injuries account for at least eight times more days of annual disability for each employee than do sicknesses and injuries of occupational origin. The worker with tuberculosis, with any of the venereal disorders, asthma, the beginnings of nephritis or some disease not related to industry is a problem equally for the industrial physician and for the general practitioner in the community. In the advancement of industrial health service all of the medical profession must work together not as competitors but as colleagues.

Humanitarian Appeal of Industrial Health

J. M. CONWAY,
Hoberg Paper Mills Inc.,
Green Bay, Wisconsin

THE prevention of accidents and promotion of health are separate and distinct undertakings, but both are necessary to a healthy business, as well as to the individual and the community.

It has been said that health losses, which are by far the largest losses in business today, the ratio ranging from 9 to 1 in dollars of cost to business to 16 to 1, and the one on which least effort has been expended, have been avoided by management circles because of the fear of the assumption of another risk with its additional cost. This is not true—at least, not among my acquaintances. I am sure this it is the feeling of all industrialists that the necessity of industrial health promotion is unquestioned. A sound mind—a mind free from worry and care—is the greatest asset any business can have. Indirectly, a healthy employee produces more—works safer and earns more money for himself and his company, but I like to think of a health and safety program as primarily for the benefit of the employee as a matter of brotherly love, and not as a selfish method of enriching one's self.

Dr. Wade Wright of the Metropolitan Life Insurance Company has this to say:

"Recent figures indicate that the expectation of life at age 20 for men in industry is 7.5 years less than that for men not engaged in industry. Industrial accidents, tuberculosis, specific occupational diseases and economic factors with their effects upon the standard of living are, of course, responsible in part for this shortening of life, but ill health attributable or related to working conditions, must be responsible for a large share of the tragic loss of 7.5 years. The truth is that disabling sickness, non-disabling sickness and premature death are extremely common among industrial workers, particularly among certain groups."

Recent figures also indicate that 85% of industry, covering 60% of all workers, is well equipped to take care of industrial accidents, but not so fortunate regarding industrial sickness.

Furthermore, I feel that the slow progress being made by industry in this vital field of industrial health is due solely to the fact that the underlying reasons and causes are not sufficiently understood, and while there is a desire to know more about them, the records and data available are still fragmentary.

The achievement of industrial safety and health so far accomplished by industry is not solely the blessing of divine providence; it is the result of the leaders responsible for the men and women under them. They have been inspired and stirred to action by the love of their fellowmen. The

helping hand between labor and employer has become a national way of thinking—a national principle and an American tradition. As long as we maintain our democratic way of living, it will always be thus. We are not perfect, but we have developed a system that is by far superior to anything of the past—it has been of inestimable benefit to the workingman in the past, and will be of even greater benefit to him in the future.

There are two reasons for preventing accidents and promoting industrial health of the employees:

1. The increase or decrease in costs.
2. The humanitarian reason.

Injured or sick workmen are not efficient, and indirectly cost the company money in lost production, insurance and medical costs. Then, too, the mind of a sick or injured man is not one conducive to loyalty or appreciation of his company, especially when he feels that his condition might have been avoided. This reflects also upon his fellow-workers.

The humanitarian reason is either direct or indirect. If direct, it is done because of the feeling of responsibility for those who work for us. If indirect, it might be due to a "prick of conscience" when we feel that injury or sickness is due to our neglect. It might be brought about by a finger of scorn being pointed at our plant, or it might be the loss of pride because of high accident and sickness rate in our business. As a representative of the National Association of Manufacturers and an industrial leader in a plant having 700 or more employees, I can truthfully say that we are interested in both costs and humanity, because they both affect the operating results of our companies, by which we are finally judged. However, for my own company, it can be said that we never did and never will attempt to save money or build profits at the expense of the safety and health of our employees.

The humanitarian appeal of industrial health is an appeal which cannot be ignored. It is the cry of the workingman to help him help himself. All he is asking for is a clean, healthy, safe place to work, and this is an obligation and duty which we as employers owe to society and the community in which we exist. The appeal of industrial health is the appeal of every right-thinking industrial leader who places the life, liberty and pursuit of happiness of his employees above the clank of the production line. Employees can only enjoy their lives, liberty and pursuit of happiness when they are in full possession of all of their faculties and in vigorous health.

We have certain laws that force industry to apply a minimum of health and safety standards, but what we are after is more than that. We should not be content with doing the bare minimum. There is that sphere over and above the bare necessities which is a moral, if not a legal obligation, and is tremendously important in the development of industrial and public relations. This sphere is dictated by our conscience and love for our neighbor.

The big problem, and we know it, is that the average worker is not too conscious of his safety and health. He is conscious of it only after something has happened and he is confronted with physical pain. Men are not prone to look after their own physical well-being as well as they should. We all know, and I think if you asked the question of each individual listening to me tonight, whether or not he had had an annual examination or periodical physical examination, only about one out of 25 would be able to answer in the affirmative. I do not doubt that they look after their automobiles to a better extent than that.

Let us take an example of the care given to race horses, greyhounds, and other race animals. Special trainers look after them and keep them in perfect condition. Why? Because the slightest let-up means the loss of the race. Why do human beings become so careless about themselves in the race through life? As human beings we go along and disregard squeaks and physical imperfections until such time as we are practically incapacitated. The employer can do many things to help. He can place the consideration of the human machine first, and the mechanical machine second, but the employee has to cooperate. He has to realize that he can win the race of life only by helping himself to keep fit, so as to be able to do a good day's work and be happy, as only healthy people are. Someone once said that the best way to keep healthy was to purchase some things we like to eat and drink and bury them about three miles from home and then once a day walk out and see if they are still there. There is a lot of good sense in that.

IT TAKES some planning to perfect the human element, but the elements of planning are relatively simple. The first line of defense against industrial sickness is an efficient program of education.

The most important thing for industry to do is to attempt to educate the workingman in the better habits of life and the precautions to take under certain conditions and get the worker to practice at home what he learns at work and to teach his family to do the same. Many employees do not realize the long term effect on their families that results from sickness through carelessness. Sometimes it spreads a disease—sometimes causes death. Sometimes, it loses for them things which money cannot buy.

The worker must be made to realize that he can play a part in spreading a communicable disease. Large plants, where many workers are in constant daily contact, are good places to spread sickness; sometimes brought from the home and sometimes arising from a condition within your plant.

Your first aid man—your doctor or your nurse should be informed immediately of anything that even savors of a suspicion that something is not just right. Don't hide the fact that you are not feeling well—bring it out in the open and find out what is wrong and have it corrected. No matter how bad it is, it will continue to get worse

if not taken care of, and you might be the cause of a fellow-worker being injured or taking ill. Cooperation—that is the main theme for the employee in the field of industrial health. The main points to remember are as follows:

1. After working hours your time is your own, but remember that how you spend it has a big bearing on your work the next day, and the condition of your health, which is of primary interest to the company you work for.

2. Follow the simple rules of health. You can get a copy of them from your first aid department, and remember, you are no exception to the rule. Bigger and stronger ones than you have taken sick and died through neglect.

3. Be a friend to your fellow-worker and help him along when you think he needs it. He will thank you for it and your company will be grateful to you.

4. Don't be a "Know It All." When you don't feel well, report it immediately, and then follow the advice of your doctor.

5. Help yourself as much as you can and don't rely upon the company to protect your health in spite of yourself.

HOW can industry help in the promotion of this vital problem of health? Some people would say by increased cash payments by employees' associations or group insurance during the sick period, to pay for the cost of illness, as well as to relieve the worry of accumulating bills. It is helpful. However, to me, this is the line of least resistance, and the easiest way to shirk one's responsibility. It is not the satisfactory way, and not the humanitarian way. To me, the answer is four-fold:

1. Recognize your problem.

2. Develop a program of correction and progress.

3. Put this program into effect.

4. Check results.

We can assume from the very fact that a company decides upon a program of health development, that management has recognized its problem.

The minimum requirements of a good safety and health program can be enumerated as follows:

1. Examination at time of employment.

2. Annual thorough physical examination—dental as well.

3. Adequate first aid department, with qualified doctor or nurse in charge.

4. Adequate program of health and safety inspection and improvement under capable supervision.

5. Education of employees.

6. Cooperation between employee and employer.

An examination at the time of employment will determine whether or not a man is fit for the work applied for. These examinations will reveal any mental, temperamental or physical imperfections which can usually be corrected if taken care of in time. The annual examination will keep the individual fit for his job, and to see that no new ailments crop out. An adequate first aid department will continually watch employees between the dates of examination. It will assist in the education of a program designed to make the employee safety and health conscious, both on the job and in his home, and with his family as well. Cooperation between employee and employer will instill confidence in the worker and encourage him to report when things are not just right, so they can be corrected, and if the subject is of such a nature that it cannot be corrected immediately, the necessary precautions can be taken to correct the situation. A man may be transferred from heavy work to light work, from wet, damp work to a dry place, from night work to day work, etc. An inspection program should be in force whereby the employee can report any change in working conditions, such as light, heat, ventilation and sanitation, which sometimes get by those who are responsible for this phase of health work.

The other means of promoting health, which are indirect—that is, not connected with medicine or advice, are:

1. Recreational fields for the employees where they can relax and make friendships.

2. Ball parks.

3. Modern and well-equipped rest rooms.

4. Lunch rooms where the employees are unable to go home.

5. Promotion of interplant sports.

6. Group insurance.

We have most of the above in our program, and of all of them, I think the installation of group insurance was about the most beneficial. Within the first month, after the insurance was in effect, we had many individuals go to the hospital for treatment and care of long-standing ailments, which could not be cured by our first aid department or medicine alone, but required operations. They have now returned, better employees, more loyal employees and are not in debt. The average worker does not like to go to a doctor or hospital, when he thinks it will cost him money. He puts it off until it is too late. This group insurance, however, overcomes this obstacle, and I feel strongly that every company in a financial position to do so, should inaugurate group insurance or something similar to it, and even for those who feel that they are not in a position, I am sure that they will find the efficiency and morale of their plant stepped up to a point where the savings will more than pay for the program.

The biggest and most controversial problem is how to put this program into effect. You know you just can't do it like the young officer taking an examination for a higher promotion, who, when asked the question: "If you had the necessary sand, cement and pole available, how would you proceed to erect a flag pole?" answered as follows: "I would call in one of the buck privates and say to him—'There's the stuff, boy, get going and put the flag pole up in a hurry'."

The carrying out of such a program requires a

lot of thought and planning, and you cannot just leave it to your subordinates.

If you are to be really successful, top management must take an interest and must be fully sold on the idea, and must be the deciding factor and leader in the movement. It cannot and should not be left to the subordinates. The supervisors, department heads and the employees should be sold on the benefits of such a program. When the selling job has been done the work is 50% finished —the easiest 50%—the hard part or last 50% is the setting up of the means by which the plan can function.

The first aid and hospital division must be under competent physicians and nurses, who are capable not only of taking care of the sick and injured, but are capable of developing and carrying out the educational program spoken about earlier. This department should be responsible directly to the president of the organization. This simplifies matters considerably in that the entire mill or factory is directly responsible to the head of the first aid or hospital division, and he or she in turn is responsible to the head of the business. This takes the health and safety program out of the hands of supervisors and department heads, which avoids red tape and gives them more time for their regular duties. Should it be under the supervision of a full time doctor and registered nurse, or a part time doctor and full time nurse, or how? To me, this is a question which can be answered only by each company individually. It depends upon the number of employees, the kind of work done, and the ability of the company to finance the safety and health program. I can just lay out the broad principles and you will have to fill in the details, being governed by your individual spheres of activity. The only thing I would care to say about this point is that the utmost care must be taken in the selection of individuals to operate the program, and that the finest results are possible only when there is a free choice of doctors by the patient—mutual responsibility between patient and doctor and the maintenance of a personal relationship between the doctor and patient which considers the patient as a human being and not merely as an ailing unit in a great machine.

The larger concerns are either doing a good job or trying as best they can. Our biggest problem is in the development of this work in the smaller concerns not large enough to have much beyond a semi-modern first aid room. Maybe, a combination of a number of these smaller concerns within a small area could pool their resources and establish a modern first aid station at some central point to be taken care of by a single nurse or physician—maybe, they could be sold on the idea that the investment would pay for itself.

Either way, something should be done for these workers, or we are going to drift into a socialized state. With the trend more and more in favor of the worker and more and more centralization of government power in Washington, it is imperative that we do something in keeping with the trend of advanced thinking, or we will have to bear the cost of it indirectly through taxes and receive no credit from our employees, whereas, we can do it ourselves and stall off the centralized idea of socialized state and socialized machine and get credit from our employees for what we are doing. While socialized medicine holds out the hope of more for less, the reduced cost made possible by mass handling, if there is any, is not sufficient reward for abandonment of the personal feeling and contact between the doctor and the patient, nor is the abandoning of its workers to a political set-up the human thing for industry to do. Neither is it the wise thing to do.

The workingman's only real asset is his health. All depends upon that. Help him to save his job by keeping him healthy. Help him to keep his self-respect by not becoming a burden to his family or friends or the object of charity from the community. Industry owes this to the man, because he gives his life to them. At least one-third of a man's working life and one-half of his waking hours are spent in the service of the company. Besides, industry can do this work at a fraction of what it would cost the same person to get the same aid through private practice. It saves the employee the additional doctor bills and thereby leaves him with more for the necessities of life. It is not an additional cost of doing business —it is a very profitable investment.

Much money and time are spent in arranging conventions of this nature, and there has been a great deal of patience on your part to sit and listen to speakers throughout the day. I should feel well repaid if I knew that you have received some inspiration, if not education, from me this evening, and I should like very much to see you all return to your jobs much inspired to do a better job than you have in the past. You can, if only you will try. It was inspiration and vision and energy that built America and these qualities will succeed in the development of industrial health.

Physical Examinations

—For Efficiency—

Frank B. Kirby, M.D.,
North Chicago, Illinois

ALL THAT we hope to gain from the time and other expenses of physical examinations is an estimate of physical capacity. What is done with the information is a problem for management. Some do one thing, some another.

Of course we do not find the physically perfect specimen of humanity once in a blue moon but fortunately most of our applicants do score grade A. It is always a matter of curiosity or something deeper to find physicians in group meetings puzzled as to the classification of sub-standard physical risks.

When it comes to a matter of paints, oil, coal, steel and other finished or crude products subject

to laboratory tests we never consider sub-standard products. Rejects are simply out. It would seem ever more essential to demand discarding the subnormal in the equally important man power employment.

Your plant is not responsible for either the health of the community or its economic requirements. Industry is not running a sanitarium. Prior to your locating where you are the acreage you occupy represented no payroll asset to the community. The situation today is different. We now are a local asset but have not relinquished our rights as to whom we shall hire any more than we give up our right to reject or purchase what we want. We still depend on the reports of our analytical department when it comes to purchases. The same principle should obtain in the purchase of man power.

This idea of fitting a man to the job is splendid for the long time employee to whom we owe consideration from years of faithful service. Here the company wants to benefit by the employee's experience and conserve his health and benefit him for as long a period of service as possible. On the other hand the applicant for a job represents no responsibility to us and if sub-standard should be rejected. This is not necessarily a hardship to him as the chances are there are 50 times as many small plant opportunities where physical examinations are not required.

Take this case. A likely looking young fellow applied with a splendid social, educational and physical background except deafness. He was sent to his physicians for treatment and returned with the statement that he was now O. K. Examination proved the contrary. The next time he came from his physician with a written note that the patient (applicant) was O. K. and should be taken on. The deafness persisted and he was refused. He begged that we "try him out." Our hazard and his would start the minute we took him on so a try-out was out of the question and he was refused.

A young woman showed mitral regurgitation of which she said she knew nothing. She had been excused from the gymnasium at high school but apparently never thought to ask why. Now there are many places for such a person by which she might render splendid service for years. The deciding point that caused her rejection was the possibility of an emergency by which she might be called to do a job for which she was not physically fit. The same with the deaf man. On emergency the one thought is the immediate job and no one would ever think that such and such an employee should first be checked at the doctor's office to see whether he was grade A, B, or C.

It would, therefore, seem good logic to use your physical examination record by which to exercise your right to employ only those people who are physically fit with no or only a limited hazard. We must protect our insurance premium and one definite way to keep the cost down is to reject the substandard applicant as you reject sub-standard goods. The time to protect your insurance costs is before employment by using your doctor's office records on the physicals exactly as you use your laboratory analysis on goods and for the same purpose.

False Positives

THERE was a limited conference held at the University of Michigan on the subject of positives in the serological diagnosis of syphilis. The conference was due to the efforts of Dr. Reuben Kahn and proved helpful and instructive.

At the meeting, a committee was formed to consider ways and means to have the Pathological Laboratory at the University of Michigan and Dr. Kahn's services function as a diagnostic clearing-house for asymptomatic and atypical cases with positive serological reactions.

The committee consists of the following:

DR. HARVEY BARTLE, Chief Medical Examiner, Pensylvania Railroad, Philadelphia, Pa.

DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

DR. C. H. WATSON, Chairman.

Following is an outline of suggestions for industrial physicians in general:

IN VIEW of the personnel relations feature arising out of positive blood tests in either preplacement or periodic examination of employees, it would seem that the following take place:

1. That all cases of asymptomatic or doubtful positive serological tests regardless of whatever procedure used, be referred to a central source for verification.

2. That inasmuch as the serological laboratory of the University of Michigan under the direction of Dr. Reuben Kahn has been outstanding in research and development along all serological lines, it be recommended to the several industries to send all asymptomatic or questionable positive specimens for verification to that laboratory.

3. That until some concrete data with respect to costs and continued financing are available, the remuneration for such tests be arbitrarily set at $5.00 a case, this amount to cover the procedures and repetitions to establish an entire diagnosis.

4. It is hoped that all industries, clinics and hospitals submitting specimens to Dr. Kahn's laboratory will keep a record of clinical and serological findings in each case so that future statistical studies may be made.

The accumulation of such data (of clinical, sociological and personnel relationship value) may then be used in approaching management for the purpose of demonstrating the need for the financing and the publication of these records in the form of a monograph. The several industries participating in the underwriting of this publication will receive proper recognition for their cooperation in a suitably phrased preface.

6. Specimens of blood should be taken in the following manner:

(a) Skin surface should be cleaned according to standard hospital technique (green soap and water cleansing, dry iodine spot for insertion of needle over vein).

(b) For sending sample the standard Keidhl tube is preferred, with substantial wooden container. Sample should be sent at once air mail.

7. The verification test is the outcome of research carried on by Dr. Reuben Kahn and he also has been responsible for bringing the facts relative to verification in false positives to the committee.

Industrial Health Congress

FOLLOWING is the program of the Third Annual Industrial Health Congress, arranged by the Council on Industrial Health of the A.M.A., to be held at the Palmer House, Chicago, January 13, 14, and 15, 1941:

Monday, January 13, 1941

9:45—"Report of the Council on Industrial Health"—STANLEY J. SEEGER, M.D., Chairman, Milwaukee.
"The Physician in Industry and National Defense"—IRVIN ABELL, M.D., Chairman, Health and Medical Committee in the Council of National Defense, Louisville, Kentucky.
"Current Needs in Industrial Hygiene Research"—PHILIP DRINKER, Professor of Industrial Hygiene, Harvard University, Boston.
"The Special Nature of Industrial Practice"—C. O. SAPPINGTON, M.D., Chicago.
"Disability Evaluation in Silicosis"—J. L. BLAISDELL, M.D., Porcupine Clinic for Silicosis Research, St. Mary's Hospital, Timmins, Ontario.

2:00—"Anatomic Diagnosis of Injuries of the Hand"—JAMES M. WINFIELD, M.D., Associate Professor of Surgery, Wayne University College of Medicine.
"Treatment of Superficial Hand Injuries and Burns"—HARVEY S. ALLEN, M.D., Chicago.
"Division of the Nerves and Tendons of the Hand"—MICHAEL MASON, M.D., Chicago.
"Importance of Purposeful Splintering Following Injuries of the Hand"—HENRY C. MARBLE, M.D.
"Prevention and Treatment of Hand Infections"—SUMNER L. KOCH, M.D., Chicago.

2:30—"The Trained Industrial Nurse"—RUTH HOULTON, R.N., Secretary, Industrial Nursing Section, National Organization for Public Health Nursing.
"The Industrial Hygiene Engineer"—(Speaker to be Announced.)
"The Safety Engineer"—W. H. CAMERON, Managing Director, National Safety Council, Inc.
"The Medical Industrial Hygienist"—PAUL A. NEAL, M.D., Chief of the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Md.
"The Physician in Industry"—ROBERT T. LEGGE, M.D., University of California, Berkeley, Calif.

6:30—An informal dinner and round table discussion intended primarily for state and county medical society committees on industrial health will be held.

Tuesday, January 14, 1941

9:30—"Employment of the Physical Handicapped"—D. L. LYNCH, M.D., President, American Association of Industrial Physicians and Surgeons, Boston.
"Aging as a Problem of Industrial Health"—EDWARD J. STIEGLITZ, M.D., Research Associate in Gerontology, National Institute of Health, U. S. Public Health Service, Bethesda, Md.
"Incidence and Costs of Acute Respiratory Disease in Industry"—ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York.
"Respiratory Disease and Air Conditioning"—CAREY P. MCCORD, M.D., Chairman, Committee on Air Conditioning of the A. M. A., Detroit.
"The Role of the Physician in Industry in the Control of Acute Respiratory Disease"—GEORGE M. PIERSOL, M.D., Philadelphia.

2:00—"Economic Importance of Visual Disability in Industry"—LEONARD GREENBURG, M.D., Chairman, Industrial Advisory Committee of the National Society for the Prevention of Blindness, New York.
"Essentials of First Aid and Later Management of Industrial Eye Injuries"—SIDNEY WALKER, JR., M.D., Chicago.
"Detection and Control of Defective Vision in Industry"—ARTHUR M. CULLEN, M.D., Dayton, O.
"Protective Equipment of Eyes in Industry"—THOMAS D. ALLEN, M.D., Associate Clinical Professor of Ophthalmology at Rush Medical College.

Wednesday, January 15, 1941

On the day following the congress, the Chicago Medical Society will conduct clinics illustrating practical problems in industrial medicine, industrial hygiene and traumatic surgery.

On the same day the Chicago Medical Society will hold a dinner and evening meeting on the relationship of the private practitioner to the industrial health movement. The program will be:

"Industrial Health — A Medical Opportunity"—STANLEY J. SEEGER, M.D., Chairman, Council on Industrial Health, American Medical Association.
"Medical Service for the Small Plant"—ANTHONY J. LANZA, M.D., New York.
"The Control of Syphilis in Industry"—HAROLD A. VONACHEN, M.D., Peoria, Ill.

Central States Society

THE Annual Winter Clinical Meeting of the Central States Society of Industrial Medicine and Surgery was held at St. Lukes Hospital Chicago, Friday, December 6, 1940, with the following program:

Morning Session

9:00—"Pathological Conference—EDWIN HIRSCH and the hospital staff.

10:00—"Spondylolisthesis" — FREMONT CHANDLER, Ass't Prof. Neurology University of Illinois.

10:30—"Mental Conditions Associated with Trauma"—ROLAND P. MACKAY, Prof. Neurology University of Illinois.

11:00—Spinal Cord Injuries" — WESLEY A. GUSTAFSON, Neuro Surgical Dept., University of Illinois.

11:30—"Hernia in Industry"—WILL F. LYON, Ass't Prof. of Surgery, University of Illinois, Chief Surgeon, International Harvester Company.

Afternoon Session

2:00—"Causes of Impaired Union in Fractured Hips"—GEORGE L. APFELBACH, Clinical Prof. of Surgery, Loyola University.

2:30—"Traumatic Lesions of the Genito Urinary Tract"—HARRY CULVER, Assoc. Prof.. of Urology, Northwestern University.

3:00—"Industrial Dermatitis, their Diagnosis, Scope and Prevention"—CLEVELAND J. WHITE, Ass't Prof. of Dermatology, Northwestern University.

3:30—"The Silicosis Problem after Eight Years of Medical and Engineering Control"—A. O. SANDER, Milwaukee, Wisconsin, H. E. DAVIS, Northwestern University.

4:00—"Open Reduction Treatment of Fractures"—JAMES A. JACKSON, Jackson Clinic, Madison, Wisconsin.

Evening Session

6:30—Dinner in honor of Guest Speaker.

8:00—"Correlation between Fracture Treatment and Fracture Pathology"—CLAY RAY MURRAY, Associated Prof. of Surgery, Columbia University Medical School, New York City.

Industrial Medicine
Reg. U. S. Pat. Off.

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Editor-in-Chief: C. O. SAPPINGTON, M.D., DR. P.H.

Editors:
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Industrial Health

THE first Annual Meeting of the American Conference on Industrial Health on November 14 was one of the most significant events of its kind and bids fair to be of greater importance in its far-reaching results.

For many years, industrial health has been one of the most "talked about" subjects in the whole field of industrial endeavor. As Woodrow Wilson said, "There was a stage of much talk."

But having passed through the "stage of much talk," there are those who have now come to a *realization of responsibility,* which is the next stage of progress and which leads to a further milestone, *constructive and coordinated action.*

There was, therefore, at the first annual meeting of the American Conference on Industrial Health the realization that there was responsibility divided among many persons, for the safeguarding, preservation and promotion of the health of the working population. There was that finality of feeling that the doctor, although he is the central figure and should always assume the leadership in health movements, cannot do the job of and by himself; that the employer, although his interests may primarily be economic ones, has a lesson in economy to learn concerning the wise use and adaptation of his human material; that the safety supervisor or director, although greatly concerned always with the prevention of accidents, must indeed have broader interests in allying himself with others in the program of health preservation in industry; that the nurse who has so mercifully ministered to the suffering of many, must herself learn new methods and make new applications in the health program; that industrial relations and public relations personnel must also play their part in this immense undertaking.

This is only to mention some of those who are so directly concerned with what we are pleased to call industrial health; all of such mention leading up to the inevitable and no longer novel conclusion, that industrial health is a real cooperative undertaking.

THE highlights of the meeting were many. Space forbids mention of all of those which were of equal interest.

One phase which was particularly enjoyed by the audience was the citing of case histories by Mr. D. A. Moore in giving employee reactions in their own words to the various kinds of experiences with a health program. One only needs to read these interesting case histories to get a compelling view of human reactions.

No less inviting to the attention and concentration were the remarkable figures given by Mr. Odom in his dissertation From the Viewpoint of Employer-Employee Relations. Actual figures in industrial experience showed that it took 78 cents per hour to pay for all of the necessary things to put a man to work. This doubled the hourly cost, because the man was paid 74 cents per hour on the average. It is thus apparent that industrial management has indeed paid out a lot of money merely for the purpose of providing the opportunity to work. It is equally obvious that "effective returns" on such a financial outlay cannot be expected unless the human element is properly protected and advised with respect to individual health. And, as Mr. Odom points out (page 614), no small part of the protection and advice which will be of the most value to both employer and employee transcends that conception of individual health which is purely subjective and becomes a matter of the healthy individual in the healthy job.

AS hardheaded as the employer may seem to be from time to time, the commonsense point of view leads us to believe that there is an immense amount of satisfaction on the part of the industrialist-employer who can assure himself that he is doing everything within reason to provide for the continued health of his employed force—that this is not after all merely an ideal, but in reality an achievement worthy of all of the captains of industry.

There are thus both good economic and humanitarian reasons why industrial health has now become a practical asset to every industrial organization, no matter how large or how small in number of employees.

It is the realization, that many different kinds of people are responsible and must constructively and coordinately contribute, that will eventually make for a high standard of individual health in industry.

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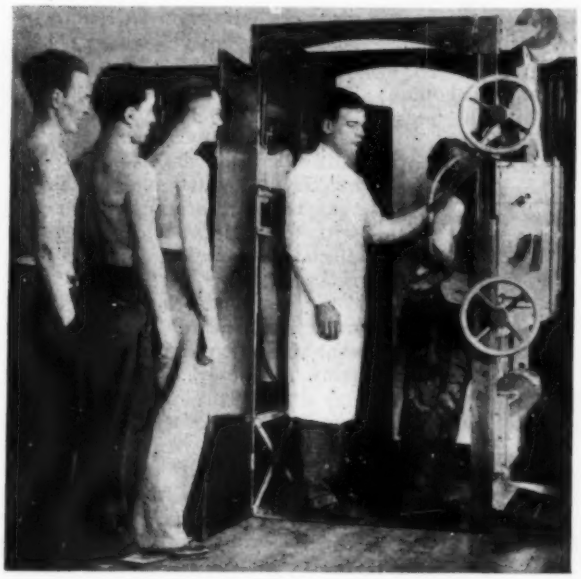

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INDUSTRIAL HEALTH AND DISEASE

Traumatic Surgery as a Specialty

TED E. RIDDELL, M.D., F.A.C.S.,
Scottsbluff, Nebraska

THERE has been created within the past 20 years a need for specialists who can treat the injured part as well as any specialist might, and still treat the rest of the body at the same time. It has often been said that too many cooks spoil the broth. If you have ever been ill, with a combination of pathological conditions and had one specialist treat your throat, another your stomach, and still another your broken leg, you have probably found that one's treatment was conflicting with the others', adding confusion to discomfort, not to mention delay in recovery.

years an American Association of Surgery for Trauma has been created.

This comparatively new field has to do mainly with the diagnosis and treatment of injured patients; and I believe I can make myself better understood when I say trauma is an irresistible force which, when it comes in contact with the human body causes a pathological injury.

During the past year alone the automobile deaths in the United States surpassed the United States casualties in the World War. Besides, many more were left maimed and deformed for life.

As well as taking care of people injured in automobile accidents, traumatic surgery takes in the field of industrial medicine; in fact, it incorporates preventive surgery with reconstructive surgery. In the former respect, preventive surgery is practiced, by devising and advising toward the paraphernalia used to prevent injuries, lung pathology, and infections in various occupations, or industries or localities.

In cases of trauma, the surgeon must combine his knowledge of general surgery, diagnosis, internal medicine, radiology, orthopedics, psychology and the practice of law so that he may reconstruct the injured, allay the insurance company, the employer, protect himself from malpractice suits, and collect his fee.

Such a complexity of personalities, abilities, and characters, has created another specialist in the practice of the healing art, known as the traumatic surgeon. He must have and preserve that art of healing the part of the body other than the injured member, so that traumatic neuroses are not developed, and so justice and equity can be given all parties interested.

The traumatic surgeon receives his patients mainly from two sources: First, from industrial plants, and of these nearly all are compensation cases, and second, from his private practice which include individuals injured by, or in automobiles, in stores, or other liability cases.

The traumatic surgeon in my part of the country must be thoroughly familiar with the Compensation Acts of Nebraska, Colorado and Wyoming, and their respective legal procedures in dealing with such cases.

Recently while attending a symposium on traumatic surgery at a Mountain States Medical meeting in Denver, I was most impressed with Dr. Joseph Brenamann, of Chicago, who said, "Don't forget when you go to care for a fractured joint, that there is a body attached to it. Care for it also, or to what advantage will you be when you have the joint taken care of, and you have no body left."

The specialty of caring for persons injured by trauma has become such a large field that within the last few

Read before the Seventy-Second Annual Session of the Nebraska State Medical Association in Omaha, April 24, 1940; published in *Nebraska S. M. J.*, November, 1940.

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In my own case, traumatic surgery is partly seasonal in some lines, and in other lines annual. In the summer our canning factory employs several hundred untrained men and women. Each person is examined physically before he is put to work, and records are kept partly as protection for the employer, and partly for the protection of the surgeon. If and when one of these people is injured, the record is readily accessible, the pre-existing deformities, and permanent disabilities are easily excluded.

This helps materially to cut down the days lost for the employee, as well as valuable time lost for the employer. Most of the injuries connected with summer season consist of back injuries, and hand injuries. In my opinion, these are caused by seasonable vegetable diets, which are insufficient for the heavy work, and the hand injuries, on account of inexperienced workers, and soft hands.

In some 22,000 cases that we have kept a record on, we have noted that right handed individuals are injured 63% on the left side to 37% on the right side. In cases of left handedness the reverse proportion obtains.

Following the summer season, our western Nebraska sugar factories start to work, and each of our seven factories employs from 300 to 400 men. These men work for the main part within a scope of a few feet from high speed and chemical machinery.

We see many cases of steel in the eye, lumbo-sacral disease, hot water, steam and juice burns, and of course numerous infections, since the presence of the sugar juice is a wonderful medium for bacteria. Continuing throughout the year, our iron mine, packing house, oil refinery, railroad and wholesale houses, contribute steadily with badly crushed fractures and intra-abdominal cases. Multiple lacerations and severed tendons from the packing house, burns and fractures from the oil refinery, and sprained backs, and infection from the railroad, wholesale houses and contractors, respectively.

During the year my office sees, approximately 2,000 cases of injury by trauma. These may be divided as follows:

Back Injury	23%
Head Injury	5%
Injured Hands	20%
Fractures and Bone Injuries	11%
Lacerations	19%
Arthritis Traumatic	4%
Hernias	3%
Perforated Viscus	0.5%
Foreign Bodies	5%
Severed Tendons	5%
Chest Injuries	3%
Kidney Injuries	1.5%

Taking each division, I might discuss briefly different injuries from the standpoint of disabling pathology.

First: Every back injury should be x-rayed, and I find after a careful radiological examination that 42%

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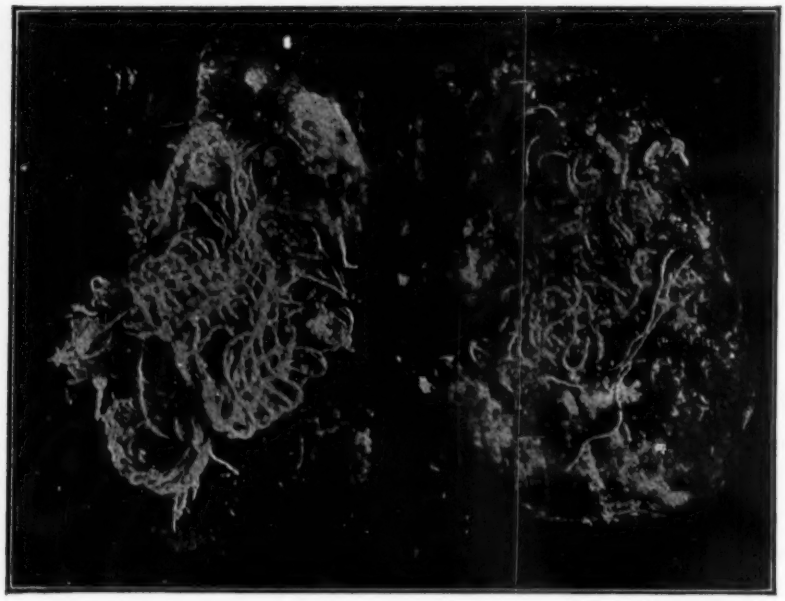

Fig. 37.—Encapsulated sponge removed after fourteen years. The capsule has been opened, and the mesh of the gauze is clearly seen. (Watson and Desnoes —J.A.M.A.)

Possibly no accident following abdominal section is more dangerous than the leaving of a foreign body in the abdomen. It is tragic for the operator and dangerous for the patient. To the casual observer it seems almost impossible for such an accident to happen, but statistics show that it does happen, and frequently. This new book is the first text ever written upon this important surgical problem. It has been written and published in the hope that the focusing of the attention of the surgeon on this subject will help to lessen the possibility of the occurrence of this type of accident.

CONTENTS

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5—Instrument Left at Abdominal Operations
6—Drains Lost in Peritoneal Cavity
7—Foreign Bodies Left in Other Operations
8—Swallowed Articles in the Abdomen
9—Deception and Malingering
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of all backs examined have some congenital defect. These are most apparent of course by the prevalence of spina bifida at the first sacral segment, by accessory ribs; by absence of transverse processes; or by absence of a portion of the body of the vertebrae. I recently discussed this condition with Dr. Goin of Los Angeles, and he had even a higher percentage of anomalies.

Of all back injuries, sacro-iliac and lumbo-sacral diseases are the most prevalent, and most of these cases are the results of lacerated supporting ligaments. I have seen only one true case of spondylolisthesis, and that one case had a fractured articulating facet of the sacrum. I believe that this term is often used, but I do not believe such a condition possible unless there is an accompanying fracture of the articulating facet.

Next among the back injuries are the compression fractures, most prevalent at the 6th and 7th cervical, the 4th, 5th and 6th dorsals, and the first lumbar vertebrae.

Second: Head injuries are quite common and are always serious. Fractures through the basal region are probably most common; and through the anterior fossae, complicating the lower jaw; and facial injuries next, with the middle fossae fractures the least common. I have found that the tendency of the first surgeon has always been to do too much in these cases. I believe that if a severe head injury is treated merely by constitutional support; that is, for the resulting shock; and provided there is no compounding of the wound, by merely raising a depressed bone, and with as little moving or handling as possible that the chances for recovery are greatly enhanced. Don't be in too big a hurry to x-ray the skull. Do not add insult to injury by handling the patient too much.

Third: Injured hands. We see in our clinic, on an average of five new hand injuries every day. The majority are contusions involving one or more fingers, but a good many have accompanying tendon or tendon sheath injury.

The laborer makes his living with his strong back and his hands, consequently it is with utmost patience that we must deal with a hand. Too often we feel that a crushed digit will never be worth anything again, and perhaps it should be amputated, only to find after a few days, that it has sufficient circulation so that eventually it can be useful. Such conservative reconstruction surgery, saves money for insurance companies, employers, and above all, saves a man's hand. Conscientious reconstruction surgery makes the surgeon in demand by large companies, that pay well for his services.

Fourth: Fractures and bone injuries are handled by the methods of which everyone is familiar; forms of traction, fixation by pins, screws; non-rustable metals, piano wire, etc. These contrivances make fractures much easier to handle than they were 15 years ago.

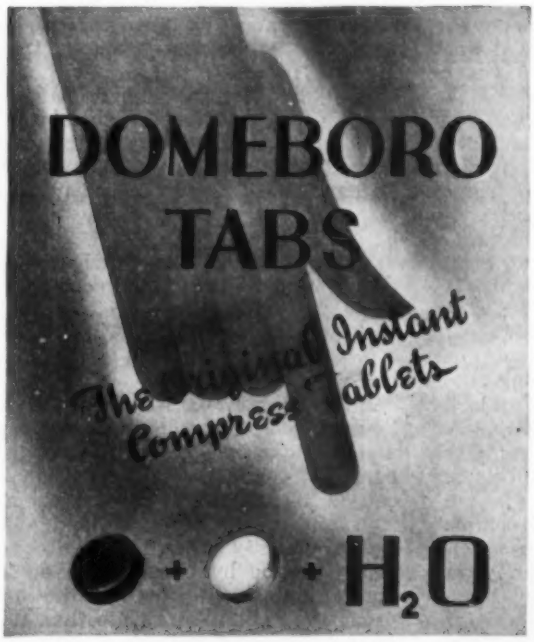
In handling compound fractures, we merely wash out the wound with sterile normal saline, and after reduction has been perfected, drain the wound with Penrose drains. I believe diathermy is an adjunct to the healing, but I feel that tissue resistance is severely lowered by the application of strong chemicals into the wound.

Fifth: Most of our laceration cases are put to rest, the wound douched out and closed tight. There are exceptions of dirty road cases of course. These are drained.

Sixth: Traumatic arthritis. This condition in my opinion is not as common as generally supposed, and in my series I have noted it only to the extent of 4%. Among these cases are shoulder, hip, ankle and wrist joint injury caused by a direct blow.

Herniae are more frequently seen as indirect, inguinal types, which in my opinion are aggravations of congenital defects. The percentage of other types is very small.

I feel there is no other successful method of treating a herniation so that the man will stand up under heavy work than by surgical repair.



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Seventh: Recently I have had four cases of perforated gastric and duodenal ulcer while the men were working. These cases must be recognized at once, and the longer the delay in operation the greater the mortality. When operated within 12 hours the chances are excellent. My method is to close the ulcer; cover with omentum, drain, and get out. I start food on the third day, and most cases are better off after operation than they were before. A majority of them need no more surgery.

Foreign bodies in the eye; steel, emery filings and hot chemicals are most commonly seen.

Severed tendons are most common among our packing house employees, and are immediately sutured and placed at rest by immobilization of the part.

Our chest injuries are mostly from the iron mines, the railroad, and from auto accidents. The causes are falling rocks; timbers in the mine; and wrecks by train and car. These cases, like head injuries, do best when not handled too often. I always try to get them in a comfortable position, then maintain it, and help with oxygen and fresh warm air to cut down respirations. Supportive treatment must be kept up, and all broken ribs taken care of. If lung embarrassments exist, they must be promptly relieved.

We have recently had several chest injuries of a very severe type. One case had 16 fractured ribs, and a perforated right lung. They were all handled as I have described, and all recovered. Only one case had to be drained.

About 1.5% of the injuries seen are kidney injuries, the most common of which is a ruptured capsule, with subsequent ptosis. These cases are best treated by a competent urologist.

In treating traumatic cases, I believe it good common sense to stop and consider that all injuries are inflammatory and that inflammation is caused by bacteria, trauma, chemicals, and the elements heat and cold.

Consequently if we deal with an injury caused by trauma, we should guard against infection by the use of antitoxin, and drainage, but not to the point of producing a chemical irritation on top of the trauma. We should not under any circumstances add insult to an already traumatized wound, by excessive or rough handling of the tissues. Every effort should be made to assist nature by putting the part (and all of the body) to rest with sufficient supportive treatment to maintain a rapid and steady recovery.

The motto of every traumatic surgeon should be: "Relieve the shock, relieve the pain, prevent infection, and restore the function of the injured member to normal as readily and as easily as possible."

If the traumatic surgeon adheres to this creed, he need never fear economic or legal embarrassment.

News

THE Grace Line has established a new Medical Department, under the direction of the Medical Director of the line, who is assisted by a staff of seven assistant physicians, six registered nurses and three trained medical assistants. Occupying an area of about 6,000 square feet, the new Medical Department consists of two units, the physical examination and first aid divisions.

DR. RALPH GREENE, founder and director of Eastern Air Lines' aero-medical department—the first department of this nature established in the air transport industry—has appointed an assistant in his work, DR. MAX BRANNAN. A native of Louisiana, DR. BRANNAN is 32. He obtained his degree of Doctor of Medicine at Tulane University, Louisiana in 1932. He served an internship at Sacramento Hospital, Sacramento, Calif. and as a first lieutenant of the Medical Corps Reserve, with the Civilian Conservation Corps.

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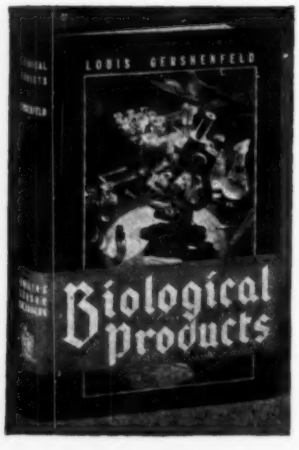

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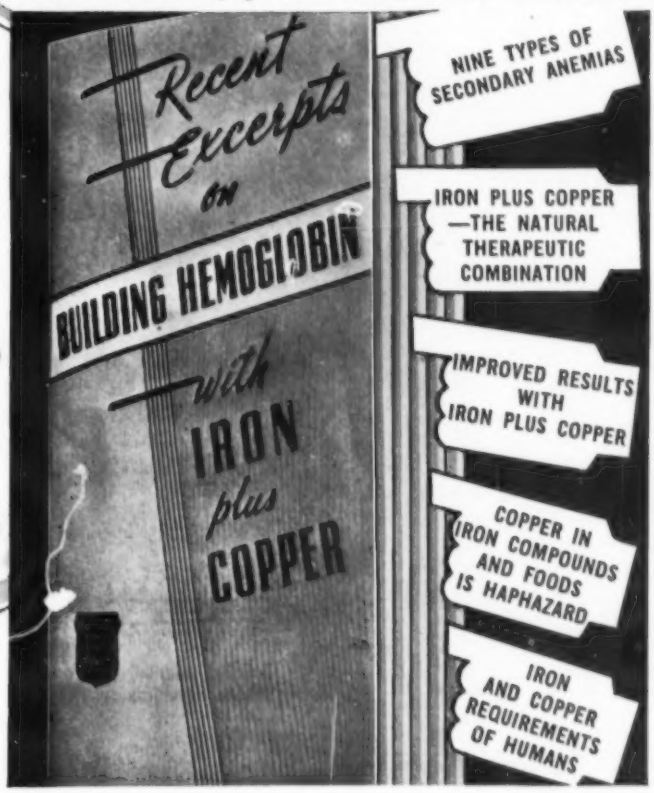
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